



VOL. 45, No. 11

NOVEMBER 1977

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### COVER PHOTO

Les Jenkins VK3ZBJ, a well known amateur in VHF and UHF circles, proudly displays some of his home built equipment. Les is also very active on ATV with equipment capable of transmitting in the 432, 576 and 1296 MHz bands.

Photo by Reg Goudge

# HAM

# RADIO SUPPLIERS

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## HANIMEX AM/CB/FM SOLID STATE PORTABLE RADIO Model 2818

OWNER'S GUIDE — Operating Instructions.

### SPECIFICATIONS:

Semiconductor Complement:  
22 Solid State Devices (11 transistors, 11 diodes).  
Frequency Range:  
AM540-1600 kHz, CB channel 1-40, FM 88-108 MHz.  
Intermediate Frequency:  
AM/CB 455 kHz, FM 10.7 MHz.  
Output Power:  
300 mW Maximum, 10% Distortion 200 mW.  
Speaker:  
3" 8 ohm Dynamic.  
Power Source:  
Battery 6V "A-A" size.  
Antenna:  
AM Ferrite Bar Antenna, CB/FM Rod Ant.  
Dimensions:  
7" Height x 3.5" Width x 1 1/2" Depth.  
Weight:  
1 lb. (without Battery).

**\$22.50 — Postage \$1.50**

## YAESU FRG-7

THE RADIO FOR WORLD-WIDE LISTENING  
AT ITS BEST — 0.5-29.9 MHz COVERAGE  
SYNTHESIZED COMMUNICATION RECEIVER



The model FRG-7 is a precision built high performance communication receiver designed to cover the band from 0.5-29.9 MHz. Its state of the art technology offers an unprecedented level of versatility. The Wadley Loop System (drift cancellation circuit) coupled with a triple conversion super heterodyne system guarantees an extremely high sensitivity and excellent stability. It provides complete satisfaction to amateurs as well as BCLs with superb performance and many features such as RF attenuator, selectable tone, and automatic noise suppression circuit.

**\$328**

## E.E.I. SOLID STATE CAR RADIO

MW BAND  
PUSH-BUTTON TUNING

### SPECIFICATIONS:

Power Supply: 12 V DC  
Receiving Frequency: MW 520KC (580M) — 1640KC (183M)  
Intermediate Frequency: 455KC  
Audio Output: 4.5W  
Transistors: 8, diode 4  
Speaker: 5" Permanent Dynamic 4 ohm  
Sensitivity: Less than 20 uV at 20 N/S  
Selectivity: More than 25 dB at +10 kHz detuning  
A.G.C.: More than 45 dB at 1,000 kHz IF rejection  
More than 40 dB at 600 kHz  
IM Rejection: More than 50 dB at 1,400 kHz  
Cabinet Dimension: 1-7/8" (H) x 6-1/8" (W) x 4-1/8" (D)

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MODEL OL64 D/P MULTI-METER. Very ruggedly constructed this model is particularly suitable for work shops. It features special scales for measurement of capacitance and inductance. Diode protested movement:

Specifications: 20,000 ohm/volt DC, 8,000 ohm/volt AC, DC volts — 0.25; 1; 2.5V; 10; 50; 250; 1,000; 5,000. AC volts — 10; 50; 250; 1,000. DC amps: 50 uA; 1 mA; 50 mA; 500 mA; 10 A. Ohms — 4 K ohm; 400 K ohm; 4 M ohm; 40 M ohm. Centre scale — 40 ohm; 4,000 ohm; 40,000 ohm; 400,000 ohm. Decibel: —20 to +62 dB. Dimensions: 6" x 4-1/2" x 3-1/2". 152 x 107 x 51 mm. Inductance — 0/5000H. Carrying case available. Model C \$6.90.

**\$32.50 Postage \$2.20**

## E.E.I. PORTABLE RADIO AM/AIR VHF

### SPECIFICATIONS:

Freq. Range: AM530-1600 kHz, AIR (VHF) 108-174 MHz. Intermediate Freq.: AM 455 kHz, FM 10.7 MHz. Output: 450 mW max. Speaker: 2 1/2" permanent-magnetic dynamic type, 8 ohm. Power Source: DC — 6V (4 x 1.5V Penlite) or equivalent. Semiconductor: 10 trans, 7 diode. Dimensions: 8 1/2" (W) x 4 1/2" (H) x 1-7/8" (D)

**\$18.90 — Postage \$1.40**

## MODEL AS100 D/P MULTIMETER

This meter features double zero diode meter protection and 3 1/2" full view easy to read 2 colour scale. It is fitted with polarity reversing switch and housed in a strong moulded case with carrying handle.

SPECIFICATION: 10,000 ohm/volt DC, 10,000 ohm/volt AC, DC Volts: 0.5, 3, 12, 60, 120, 300, 600, 1,200. AC Volts: 6, 30, 120, 300, 600, 1,200. DC Amps: 12 uA, 6 mA, 60 mA, 300 mA, 12 A. Ohms: 2k, 20k, 200, 2000, 20,000 ohm. Centre Scale: 20 ohm, 2,000 ohm, 20,000 ohm, 200,000 ohm, 20m ohm. Decibel —20 to +57 db. Dimensions: 7-3/5 x 5-2/5 x 2-3/5 ins. Carrying case for model I — \$7.90.

Price: \$52.50 — Postage \$2.20.

## MODEL NC-310 DE LUXE

1 WATT 3 CHANNEL  
C.B. TRANSCEIVER

- WITH CALL SYSTEM
- EXTERNAL AERIAL CONNECTION

### SPECIFICATIONS, NC-310

Transistors: 13.  
Channel Number: 3, 27.24 OMHz Citz. Band.  
Transmitter Frequency Tolerance:  $\pm 0.005\%$ .  
RF Input Power: 1 Watt.  
Tone Call Frequency: 2000 Hz.  
Receiver type: Superheterodyne.  
Receiver Sensitivity: 0.7 uV at 10 dB S/N.  
Selectivity: 45 dB at  $\pm 10$  kHz.  
IF Frequency: 455 kHz.  
Audio Output: 500 mW to External Speaker Jack.  
Power Supply: 8 UM-3 (penlite battery).  
Current Drain: Transmitter: 120-220 mA.  
Receiver: 20-130 mA.  
Price: \$105.00 — Postage \$1.40



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# amateur radio

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Advertising:

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## QSP — PANDORA'S BOX

The Amateur Service is unique and it is international. It is our duty to retain both.

The definition in the ITU Radio Regulations is included in the Australian Handbook 'for amateurs' and is three-pronged. It is a service of —

- self training,
- intercommunication, and
- technical investigation, etc.

The definition is good but too concise for ease of understanding by the non-amateur. His only view of the service is the intercommunication aspect. To him this is the beginning and end of it. We have had good mileage from this out of emergency situations around the world. But without the other two prongs the definition would fall down.

WARC 79 now has Article 41 included on the Agenda. This Article of 6 clauses details the service requirements for amateur stations (banning of amateur radio, third party, more below 144 MHz, technical qualifications, power, application of the general rules, spurs, identification and amateur satellite operations in shared bands).

A significant number of those who will be attending WARC 79 on behalf of many member countries may not know much about the background, development, history and aims of the amateur service.

Thus, if they are let loose on Article 41, it could happen that they will come up with outrageous, preposterous or positively undesirable or harmful amendments, which could be carried by numerical strength.

For this reason IARU HQ has advised member societies that it is considered in the overall best interests of the service not to take these risks. It is agreed there are some aspects of Article 41 which we all think can be improved, but by and large we have got along reasonably well on a global basis with what is there now.

We can follow our varied interests without too much hindrance. We can keep up with the state of the art within those guidelines. We can continue to retain our uniqueness as a radio service.

I hope this provides you with the latest background to the varied problems of WARC 79.

DAVID WARDLAW, Federal President. ■

## WIRELESS INSTITUTE OF AUSTRALIA

Federal President: Dr. D. A. Wardlaw VK3ADW

Federal Council:

VK1 Brig. R. K. Roseblade VK1QJ  
VK2 Mr. T. I. Mills VK2ZTM  
VK3 Mr. C. K. Maude VK3ZCK  
VK4 Mr. N. F. Wilson VK4NP  
VK5 Mr. I. J. Hunt VK5QX  
VK6 Mr. N. R. Penfold VK6NE  
VK7 Mr. P. D. Frith VK7PF

Staff: Mr. P. B. Dodd VK3CIF, Secretary.

Part-time: Col. C. W. Perry, Mrs. J. M. Seddon and Mr. T. Cook (AR advertising).

Executive Office: P.O. Box 150, Toorak, Vic., 3142.  
2/517 Toorak Rd., Toorak, Ph. (03) 24 8652.

Divisional information (all broadcasts are on Sundays unless otherwise stated):

ACT:

President — Mr. E. W. Howell VK1TH  
Secretary — Mr. D. J. Farquharson VK1ZDF  
Broadcasts — 3570 kHz & 146.5 MHz: 10.00Z.

NSW:

President — Mr. T. I. Mills VK2ZTM  
Secretary — Mr. I. A. Mackenzie VK2ZTM  
Broadcasts — 1825, 3595, 7145 kHz, 28.5, 52.1, 52.525, 144.1, Ch. 6 and other relay stations: 01.00Z. (Also Sunday evenings 09.30Z and Hunter Branch, Mondays 09.30Z on 3570 kHz and Ch. 3 and 6).

VIC:

President — Mr. S. T. Clark VK3ASC  
Secretary — Mr. P. A. Adcock VK3ACA  
Broadcasts — 1825, 3500, 7135 kHz — also on 6m, 2m SSB and 2m Ch. 2 repeater: 00.30Z (Also on Radio 3HA).

QLD:

President — Mr. D. T. Laurie VK4DT  
Secretary — Mr. P. Brown VK4PJ  
Broadcasts — 1825, 3500, 7146, 14342 kHz: 09.00 EST.

SA:

President — Mr. C. J. Hurst VK5HI  
Secretary — Mr. C. M. Pearson VK5PE  
Broadcasts — 1820, 3550, 7125, 14175 kHz; 28.5 and 53.1 MHz, 2m (Ch. 6): 09.00 S.A.T.

WA:

President — Mr. R. Greenaway VK6DA  
Secretary — Mr. H. R. Penfold VK6NE  
Broadcasts — 3500, 7080, 14100, 14175 kHz, 52.656 and 2m (Ch. 2): 01.30Z.

TAS:

President — Mr. R. K. Emmett VK7KK  
Secretary — Mr. H. E. Hewens VK7HE  
Broadcasts — 3570, 7130 kHz: 09.30 EST.

NT:

President — Mr. Doug Haig VK8JD.  
Secretary — Mr. Henry Anderson VK8HA.  
Broadcasts — Relay of VK5WJ on 3.55 MHz and on 146.5 MHz at 2330Z. Slow move transmission by VK8HA on 3.555 MHz at 1000Z almost every day.

Postal information:

VK1 — P.O. Box 1173, Canberra, 2601  
VK2 — 14 Atchison St., Crows Nest, 2066 (Ph. (02) 43 5795 Tues & Thurs 10.00-14.00h).  
VK3 — 412 Brunswick St., Fitzroy, 3065 (Ph. (03) 41 3535 Sat 10.00-12.00h).  
VK4 — G.P.O. Box 638, Brisbane, 4001.  
VK5 — G.P.O. Box 1234, Adelaide, 5001 — HQ at West Thebarton Rd., Thebarton (Ph. (08) 254 7442).  
VK6 — G.P.O. Box N1002, Perth, 6001.  
VK7 — P.O. Box 1010, Launceston, 7250.  
VK8 — (incl. with VK5), Darwin AR Club, P.O. Box 1418, Darwin, 5794.

Slow move transmissions — most week-day evenings about 09.30Z onwards around 3550 kHz.

# WIANEWS

## POSTAL MOTIONS

The three Postal Motions listed in WIANEWS, October AR, were passed by Federal Council and therefore now represent policies of the Institute.

## LEGISLATION

For a long time the Institute's representatives have made it known to those concerned that the WIA is actively interested in any impending legislation which affects the amateur service. For example please see WIANEWS in AR for December 1975.

This matter was the subject of talks with Government officers in April and May and culminated in a discussion paper being handed to the Department during June. The paper dealt with definitions, controls over equipment particularly transmitters, and the need for legislation to cover a number of assorted situations.

It was agreed there is little room for debate that the Wireless Telegraphy Act of 1905 requires substantial revision and assumes, as is well known, such a revision is imminent. No attempts were made to evaluate the extent of the Commonwealth constitutional powers or to anticipate the many areas of detail requiring attention by reference to other bodies, for example, industry in relation to the control of EMC. The discussion paper did not pretend to set out the policy views of the WIA at that stage except to highlight some major matters of special interest to the amateur service as a whole.

Both the P and T Department and the WIA know that the law relating to the general radio services is under review and both are aware of the changes which have recently occurred or are proposed. It is therefore pointless for either of them to press for a general revision of the Handbook.

## 50 cm BAND PLAN

At the September meeting of the VHF/UHF Advisory Committee (a Committee of the Executive) a draft band plan for the 50 cm band (576-583 MHz) was discussed and prepared. Now that the P and T Department has given approval in principle for cross-band ATV repeaters (70 to 50 cm bands) it seems desirable to nominate certain frequencies in the 50 cm band so as to minimise interference between different modes.

Details of the draft band plan are to be published shortly in AR for general comment. The proposed video carrier frequency is 579.25 MHz.

## MUF FOR VHF OPERATORS

The VHFAC advise in preparation for the Dx season the necessity to clear the calling frequency as soon as a contact has been established and then to QSY higher in frequency (Move Up in Frequency — not down).

## MORSE EXAMS

The Federal Education Co-ordinator asks why have CW examinations at all, especially Novice Morse. The reason mainly derives from the ITU regulations which require that all amateurs not exclusively using frequencies above 144 MHz shall prove the ability to send correctly by hand and to receive correctly by ear, texts in Morse code signals. Australia is in derogation, much to her embarrassment internationally, because of setting the 6m band as the lower limit. At WARC 1959 many administrations wanted 1000 MHz as the lower limit.

The big question, raised with the Department, is the spacing format of the Novice Morse exam. The P and T Department has stated that the ITU method of spacing is to be used. The length of the dot governs all the parameters. An analysis of candidates' reactions and additional tests carried out by experts shows that 5 w.p.m. ITU standard Morse is much more difficult to copy than 5 w.p.m. where the characters are sent at a higher speed and the spacings lengthened to compensate. The submission made to the Department in May was based on a carefully documented compilation by Roger Davis, VK4AAR using a microprocessor to generate various CW speeds by sending letters at a constant rate and varying the spacing to double or triple the spacings. There is a distinct brain recognition problem in comprehending the ITU standard CW at the low speed of 5 w.p.m.

He also asks why steps are not being taken to make the Novice licence as easy as possible to attain without necessarily lowering standards in the process.

## AMATEUR ADVISORY COMMITTEES

The role of these Committees has been discussed for many years and a review has been in the pipeline as an idea for some time. Certain events during August highlighted the situation already alluded to in the letter of 8th August to the P and T Department, see Sept. AR page 21 Appendix A Part A(9). The Advisory Committee system does assist towards reducing arbitrary decisions by the licensing authority, particularly in the light of the submissions by the WIA relating to third party provisions (see WIANEWS in the same issue).

## GOVERNMENT POLICIES

The opening address by Senator J. W. Knight (on behalf of the P and T Minister) at the NCRA's first national convention (CB) in Canberra on 3rd September contains passages of interest to radio amateurs.

In referring to the introduction of CB in Australia he pointed out, it is reported, that the introduction of a (new) radio service is a very complex matter. To preserve the RF spectrum it has always been necessary to carefully restrict radio communication services to meet needs which could be demonstrated as essential and which are generally in accordance with the philosophies of the ITU.

He is reported as saying that another particular concept (apart from vast distances in Australia between cities) of any administration is the possibility of interference caused by transmissions in the HF part of the spectrum — very significant in relation to the introduction of CB.

The Government was anxious that Australian manufacturers should be given an opportunity to compete in the CB market and also believed on technological grounds the advantages of UHF as most suitable. He hoped CB-ers would change to UHF as quickly as possible.

Something still to be resolved was the maintenance of discipline on CB bands and he recommended self-regulation since Government could introduce the necessary legislation but preferred a representative organisation for consultations. He gave notice of Government intentions to change the CB rules and regulations.

There is concern, he said, about advertisements appearing in specialised CB publications advertising the sale and availability of amateur service equipment and power amplifiers. The Minister (P and T) wished it to be made quite clear to everyone concerned that the Government will not stand by and allow pirating activities into other authorised services. Nor will Government stand by and allow power amplifiers designed for another frequency to be sold for and used within the CB service. It is Government's view that strong action should be taken to ensure that other authorised services are protected.

The Government, he went on, is presently preparing a new radiocommunication Act to replace the existing WT Act and expected it would be introduced in the 1978 Autumn session of Parliament. The drafting of the Act is now taking place and it will rectify the faults of the old Act as well as making provision to strengthen Government control over regulating of services. He hoped the UHF CB service will soon commence and referred to a suggestion that Government's decision in relation to the acceptance of the interim HF (CB) service transfers an illegal operator situation of 1977 to 1982. This was not the case, he said. In 1982 operators of HF equipment will only be allowed to continue using that equipment under the auspices of the amateur radio service. Five years was enough time for people to qualify as amateur operators although it might well be that modifications to the existing examination procedures and restrictions will take place during this period. The WIA he said had already made a submission seeking changes which are now being studied.

At this Convention the WIA ACT Division held very preliminary talks with the NCRA and laid on demonstrations of amateur operators and equipment.



## 1977 CALL BOOK

Some of the call sign listings were poor in print quality but now under investigation are proposals to change our computer records to a commercial company undertaking the entire operation from computer records through to the mailing of AR! If this occurs the computer printouts for future call books hopefully will be an improvement. At the same time it should be possible for call signs to be printed on AR labels. Keep your fingers crossed: negotiations are still at an early stage.

One of the several problems which have emerged is the absence of some call signs from the 1977 listing. This was caused by membership changes occurring during the preparation of the input material as explained in the editorial in the Call Book. Please ask any VK amateur not in the Call Book to write in to the Executive Office if his call sign was issued prior to this year.

## QSP

### EX-G CLUB

The Secretary of the Ex-G Radio Club, Australian Division, is Steve VK3ZB, of 1 Emily Avenue, Clachman, SA 5062. Anyone born in the UK and now living in VK might like to contact Steve for details of membership, newsletters, etc.

### KERMADEC ISLAND EXPEDITION

Auckland Branch of NZART plan to activate Kermadec Island from approximately 20-31 October under the call sign of ZL1AA/K. This island counts as a separate country for DXCC purposes. At least five operators, including two YLs, will use all bands 16-10m, both phone and CW. Split frequency operation is proposed with breaks for transceivers. Special attention will be given to weak and QRP stations. Stations calling are requested to do so only in accordance with the operator's directions and to QRS to 15 w.p.m. on CW.

### FRENCH STATIONS ON 160 METRES

For the first time since 1939 several French amateurs have been granted permission to operate 160m for special contests on the 1826 kHz only. The mode is A1, power to the PA stage 10W, and clearance must be obtained before each contest. OST June 1977.

### CANADA'S FIRST BLIND-DEAF AMATEUR

Yes, according to Worldradio News for July 1977, Kay Clarke of Ontario has just passed her amateur radio licence exam and has the call VE3KAY despite the double handicap of being both deaf and blind. The basic device used as a receiver is a sort of loud-speaker of special design with a plastic plate in place of the grille, which vibrates in response to the dots and dashes of Morse code coming in on the receiver. She "reads" the code by touching the device with her fingertips and hit 14 w.p.m. in her exam. Kay was helped by many Ontario amateurs, including two blind amateurs VE3KF and VE3EEK.

### IREE—DIGITAL SYMPOSIUM

The Institution of Radio and Electronics Engineers is holding a Symposium for Engineering Support Staff on Digital Processors and Analog-Digital Interface Circuits at Clunies-Ross House, Parkville, on Thursday, 3rd November, from 09.00 to 17.00h.

### QE PREFIX

On 7 June 1977 reported that British amateurs would be permitted to use the special prefix QE from 4th to 12th June in honour of HM the Queen's Silver Jubilee.

### EXAM EXEMPTIONS

The P. and T. Department has recently approved exemptions from the AOCIP theory exam for two persons possessing suitable qualifications. These people possessed Radio Technician Certificate and Broadcast Ops. Certificate respectively. To obtain an exemption, the application must include a detailed analysis of the course syllabus covered, and documented evidence of a satisfactory pass in all subjects. Applications should be forwarded to P. and T. Department Central Office.

## VARIOUS

Good news for members. The Federal element in the 1978 subscriptions will remain the same as for 1977, namely AR \$7.20, IARU 30c, and Federal \$7.50, making a total of \$15.00 for each full and associate member. Divisional Councils have been considering ways and means of raising their pro rata amounts towards the expenses of WARC 79 representations.

The Federal President paid an official visit to the SW Zone Convention in Griffith during the first week-end in October and is hoping he can also find time to attend other Conventions including the NT Communications Convention '77 in Darwin on 3/4 December.

Some mention really ought to be made about Youth Radio Services activities in VK2 but this will have to be held over to December for space reasons.

### ITU MEMBERSHIP

The total membership of the ITU is now 153 consequent upon the admission of the Republic of San Marino. 26 of these countries are in Region 3 and exactly half of these countries do not have an IARU membership society. In fact many of them have no amateur radio at all. Want to know what countries these are? Afghanistan, Bangladesh, China, Fiji, Indonesia, Iran, Khmer Rep., N. Korea, Laos, Maldives, Nauru, Nepal and Vietnam. Data from IARU RI News, September 1977.

### NEW PREFIXES

IARU RI News lists the allocation of two new call sign series—H4A to H4Z to the Solomon Islands and J3A to J3Z to Grenada.

## EDITOR'S DESK

By BRUCE BATHOLDS  
VK3UN

### AMATEUR RADIO — AUSTRALIA'S WINDOW ON THE WORLD

Next month starts the usual hustle of Christmas and New Year celebrations.

In accordance with the practice over the last couple of years, we will be producing a bumper issue of AR. This year, in an endeavour to attract interested newcomers to the hobby, the December issue will be published in the form of a book.

Its title will be called "Amateur Radio — Australia's Window on the World", and will be available for sale to the general public on the book stalls.

Members of the WIA will be receiving a copy free in lieu of a normal issue of Amateur Radio.

The purchase price will be \$1.35 plus 40c postage.

Copies will also be available in early December from the WIA, PO Box 150, Toorak, Vic. 3142.

Here is an opportunity to buy an ideal Christmas gift for a friend who may be showing an interest in amateur radio as a hobby.

The issue will contain several original articles specially selected for the newcomer, as well as the normal type of articles and Department series.

We would ask that this information be made known as widely as possible.

### 1977 CALL BOOK

By the end of September stocks of the 1977 Call Book were virtually exhausted. Only enough copies remained on hand to meet an occasional request for a single copy. Taking into consideration the increase in size and price compared with the 1975 edition, and the fact that the original 1975 print run was increased by 50 per cent, the result is most encouraging. The defective characters in some places in the call sign list was a computer print-out function over which the institute had no control. This occurred even though a new ribbon had been requested for the Call Book print-out.

### NORTHERN TERRITORY COMMUNICATIONS CONVENTION

On the 3rd and 4th of December the most comprehensive Communications Convention ever will be held in the Northern Territory at the Darwin Community College.

This general convention, open to the public, has been organised by the combined efforts of the two hobby radio factions in Darwin.

Display and lecture material will be presented by the Darwin Community College, Telecom Australia, A.B.C., Government Departments, the Defence Forces, local and interstate businesses, houses and the Amateur and Citizens Radio Organisations.

The community of Darwin, intrastate and interstate visitors will find that aspects, applicable to themselves, will be covered.

Bodies interested in participating by way of displays, lectures or field demonstrations should contact Mr. John Tate, State Director of the NCRA, or Mr. Doug Haig, President of the Darwin Amateur Radio Club, on 85 2016.

### RFI AND OTHER PROBLEMS

The June 1977 issue of Worldradio contains an article by KERLP on the formation of the "Personal Communications Foundation" to combat a major legal crisis said to be only the tip of a future iceberg. To quote "Citizens' Band and Amateur Radio operators are currently being sued in virtually every State for electrical interference, violations of antenna and tower ordinances and property deed restrictions stemming from their use of transceivers, towers and antennas manufactured and sold by the personal communications industry. State and local communities are enacting specific criminal statutes or are employing existing criminal nuisance and disturbing the peace statutes to subject users to substantial fines and the possibility of imprisonment when neighbours complain of television and radio frequency interference. Local communities in all States have enacted zoning ordinances which either prohibit radio towers and antennas entirely or which limit the height of antennas to as little as six feet above the roof line and which impose size limitations effectively prohibiting antennas longer than a medium sized television antenna. The explosive growth of the CB service in the US and Canada in the 1970s has placed personal communications in essentially the same position as the automobile at the start of the 20th century (local communities promulgating legislation prohibiting cars from city streets as being ugly, noisy machines scarifying livestock, emitting unpleasant odours and disturbing the peace)."

# DIGITAL LOGIC CIRCUITS IN COMMUNICATION

J. Day VK3ZJF

Many people in amateur circles have played around with digital logic circuits, many also have not. In communication equipment we are seeing more and more digital logic creep in. This may be good, it may be bad, it depends on which side of the fence you sit. For those interested I intend to describe some applications I use in communication equipment and hopefully inspire other people to do the same.

Probably one of the most common applications of digital logic in amateur equipment is the PHASE LOCKED LOOP FREQUENCY SYNTHESIZER. The PLL SYNTHESIZER is becoming more and more commonly used, as our VHF and UHF bands become more crowded, for the generation of large numbers of closely spaced channels.

The PLL synthesizer relies on a basic mathematical equation for its operation.

$$f_c = f_r \times N \quad \text{or} \quad f_r = f_c/N \quad (\text{Eq. 1})$$

Where  $f_c$  = carrier or output frequency.  
 $f_r$  = reference frequency.  
 $N$  = division ratio.

Basically the PLL synthesizer looks like this:

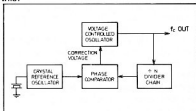


FIG. 1: Fundamental PLL Synthesizer.

The heart of the PLL synthesizer is the phase detector. Two signals are applied to the phase detector. One of these frequencies is the reference frequency. This reference frequency is normally derived from a crystal oscillator or some other stable source. The second signal comes from the source which is required to be controlled. If this signal is lower than the reference frequency, the output of the phase detector will be a continually high voltage. If it is higher, output will be continually low. When the two frequencies are the same, the control output will be pulses corresponding to the phase shift between the two signals thus attempting to bring the two signals precisely into step with each other. The above information applies to most integrated phase detectors and specifically the MC14046 CMOS type from Motorola.

From the output of this phase detector, we drive a voltage controlled oscillator. The oscillator is basically a VFO which is

tuned by using a varicap type diode. A typical circuit of a VCO is shown below.

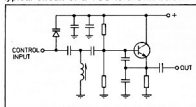


FIG. 2: Basic Voltage Controlled Oscillator.

This oscillator circuit, it can be seen, is almost identical to the conventional Colpitts type VFO, the only difference being the varicap control element. Normally the VCO is fed through a low pass filter so that it will follow a smoothed out version of the control waveform that corrects the frequency.

Thus if we have a crystal controlled reference oscillator, a phase comparator and a VCO we can lock the VCO to precisely the crystal frequency. In a lot of cases though, the required output frequency is different to the reference frequency.

Let us say we want a very stable source of signal at 100 MHz precisely and we have a 1 MHz reference. If we want a signal at 100 MHz we must obviously run the VCO at 100 MHz. How do we control this from a 1 MHz reference? If we divide 100 MHz by 100, what do we have? 1 MHz, how convenient! By comparing this with the 1 MHz reference we can control the 100 MHz and have its stability basically that of the reference. (See Fig. 3).

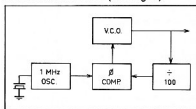


FIG. 3: Phase Locked Multiplier.

How strange, this look precisely like the block diagram of Fig. 1, and it can also be seen that it conforms to Equation 1.

$$f_c = f_r \times N$$

$$100 = 1 \times 100 \text{ (MHz)}$$

Now let us complicate things a little. If we replace the crystal reference oscillator with a 1-2 MHz VFO, what happens? If the VFO is set on 1 MHz the VCO frequency will be divided by 100 and the phase detector will lock the VCO to 100 MHz. If the VFO is shifted to 2 MHz the VCO will still be at 100 MHz, when this

is divided by 100,  $f_c/N$  to the phase detector will be low, and the phase detector will force the VCO to increase in frequency until the  $f_c/N$  component is equal to the new reference frequency of 2 MHz. The VCO will now be at 200 MHz. Thus we now have a well controlled  $\times 100$  multiplier. Just one more form of PLL synthesizer.

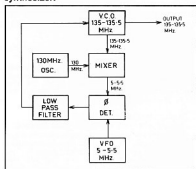


FIG. 4: Phase Locked VFO.

We don't really need to use a frequency divider in a phase locked loop, instead we can use a mixer chain. Say we wish to build a single conversion tunable receiver to cover 144.000 144.500 MHz, using a 9.000 MHz IF similar to the design presented by Harold Hepburn VK3AFQ.

To do this we must first work out the required injection frequencies. The injection will be between 144.9 and 144.5-9 MHz, or from 135-135.5 MHz. If we choose to use a 5-5.5 MHz VFO we have the opportunity of having a good high stability oscillator, none of whose harmonics fall into either the signal or IF frequency ranges. If we have a crystal oscillator with which to mix the output we can bring the VCO back to 5 MHz. (See Fig. 4.)

Now we have a VFO on 135-135.5 MHz which has the stability of the VFO and crystal heterodyne oscillator combined.

By using the basic phase locked multiplier we can generate a much more complex unit which is what is commonly called the phase locked synthesizer. In this form of system the divide by N counter is made variable. Consider a practical example.

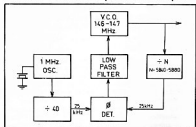


FIG. 5.

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# CQ AERONAUTICAL MOBILE

Bob Cunningham VK3ML,  
384 Glenferrie Road, Malvern.

My very first flight ever was made at night from the Essendon aerodrome around 1929. On this occasion the Victorian Division of the WIA was operating experimental aircraft radio in conjunction with the Aero Club and, in fact, had a workshop in the hangars at Essendon. A transmitter was built by members of this group and was made to fit in the front cockpit of the aircraft. It had been decided to advertise a forthcoming radio show in Melbourne by making the words RADIO SHOW with automobile headlamp globes fitted under the lower wing of the aircraft. A flight was to be at night and someone was to describe what Melbourne looked like from one, or perhaps two, thousand feet. Yours truly was the "lucky" one chosen for this task!

Now, consider a 60 h.p. Moth aircraft loaded with two men plus some six car batteries and a radio transmitter. That is one thing. Next consider the Essendon aerodrome in those days. It was a large paddock, encircled with a fence, and perhaps a few hundred yards in diameter. Landing lights did not exist and my pilot, Hughie Hughes, the Aero Club instructor, had chosen a dark starless night for this exciting adventure!

The rules of flying in those days required one to taxi to the extremity of the field so that the longest take-off path was used. Finding the fence was Hughie's first task, which he successfully did with the aid of a torch of about the same brilliance as used by ushers in theatres. With the 60 h.p. engine roaring like a snorting monster we proceeded to take off. Alas, the fence on the opposite side of the 'drome loomed up with the tail skid still on the ground. Hughie throttled back the engine and suggested I should disembark and he would try again without my weight. This he did and found with the aid of some grit and cunning a take off with my extra weight was possible. I am happy to say that the venture was successful. Once up the world was our own. I commenced transmission and told listeners through 3LO what Melbourne looked like at night from the air.

Coming back was another story. There were no illuminated freeways or well lit shopping centres in those days. Street lighting was by shaded 100 watt or maybe 200 watt globes and the Essendon airport

was conspicuous by a black patch of land in a very lightly populated area. However, Hughie found the patch and set the nose down to land. The landing light consisted of a run-down torch which showed up mother earth just ahead of the landing wheels.

To me, that was a big deal! Sweet innocence I call it. Ask me to do the same trip today with 60 horses, two men and six batteries with a run-down torch for navigation? You MUST be joking! Still, it must have been one of the early aeronautical mobile operations in which the WIA played a great part.

Now I have a friend, Geoffrey Cox. He is the son of Harold Cox VK1GU, in Canberra, who pioneered the high frequencies over the Pacific many years ago. Geoff is a pilot at the Victorian Gliding Club at Benalla, some 150 km up the Hume Highway from Melbourne. I was invited to be his guest for a flight some weeks ago. After wearing down some bitter opposition from the XYL and promising to send messages back from Cloud 9 if I should ever reach the New World, I arrived at Benalla with Geoff. This location, by the way, had been an EFTS during the war years and later a migrant centre.

This Club has many members of both sexes and pilot training courses are in continuous operation. The glider to take me aloft had a wing span of some 17 metres and had become a popular two seater after its introduction into Australia from Rumania. Other gliders I saw included single seater competition aircraft having a wing span of some 15 metres. Our machine was a model IS-28.

For good flying conditions one needs atmospheric convections, experienced mainly in the summer. With favourable conditions gliders may stay aloft for hours, and cross country flights of 300 to 500 km are common, whilst beyond 500 km is quite possible. One must have uplifting currents, known as thermals, to achieve such performances. Unfortunately my flight was



Bob VK3ML

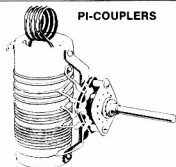
in the winter and because the sport is now so very popular, it was not until late in the afternoon when the thermals had died down that I was treated to a flip of only half an hour. There is not much room in the cockpit of a glider and you certainly do not have friendly hostess treatment! You are well belted in with the aid of a shoe horn, followed by the closing of a plastic canopy overhead. A tow line of some 150 feet is attached to a "lug" aircraft which tows you aloft to some 2-3000 feet, at which altitude the pilot of the glider opts to cast off the rope. It is a great sensation to be pulled gently to the cast off height and then to float alone. We must have flown some ten minutes at 3000 feet at about 50 knots before Geoff put the glider into a gentle dive at about 90 knots to demonstrate the aircraft's flexibility. Whilst all this was going on I extended the whip antenna of my 1 watt two metre transceiver and found I could trigger the repeaters at Wodonga and Bendigo with ease. I also had four simplex channel QSO's on 40 and 50. I thoroughly enjoyed sitting up there with just the whistling of the wind past the canopy and with no motor noise. Once again the world is your own at the base of the clouds and you are seeing countryside at 50 knots which you would not see whilst flashing past in a 500 knot modern airliner.

When the pilot feels he has no further air support he turns straight for home and glides in like a bird making a landing. When you finally come to a stop club members come out to man-handle the glider to other awaiting aspirants.

To me it was a great day and if I am asked if I want another flip in a glider I'll say "Just ask me". No motor is better than 60 horses.



Cockpit of glider.



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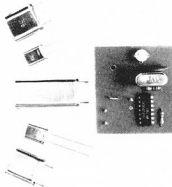
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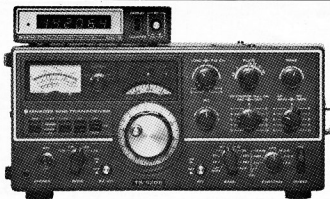
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Bruce H. Riley, VK3ZSR  
9/33 Evans St., Wangeratta, Vic. 3677

Over the years there have been a great many designs for DC supplies with good regulation. Most of these have, however, been fairly complex and use discrete components. With the advent of integrated circuit regulators the design of such supplies has been simplified, but many designers have included a great deal of sophistication into their designs, and hence increased the complexity. An example of such a supply was the design in AR of April 1975.

at the end of this article, there is no component which also act as emitter followers. Resistors R5 and R6 are small value resistances which balance the current drawn by the two until each is carrying about 50% of the total current. Note that these two resistors must be capable of handling the full current output of the power supply. A short length of resistance wire is the best method of making these. Alternatively, 5 feet of 24 swg copper wire wound into a coil, air spaced, will work equally as well, but will take up more space. Note that these resistors will dissipate some heat and this should be allowed for.

Fully variable current limiting is provided by RV 2. As the current drain from the supply increases, the base current of the output pair will be increased by the regulator, and the voltage drop across the

potentiometer will increase. The voltage across this resistor is applied to a transistor within the chip. When this exceeds 0.6V the transistor becomes biased on and shunts any further current from the output.

Note that RV 2 may be placed in any position where the current which flows through it is proportional to the total current drawn from the supply. The three choices are (i) in series with the output of the supply itself, (ii) as shown on the diagram and (iii) in series with the chip (pin 10) and the base of Q1.

Choice (i) is less satisfactory because the resistor must carry the full output current, i.e. 5 amps. This means that the resistor may be required to dissipate some 3 watts of power, and potentiometers of this rating are not cheap. Positions (ii)

Whilst such supplies, with all their sophistication, have a lot going for them, many people require something a little simpler. The circuit to be described should suit the needs of these people. As may be seen from the measured performance

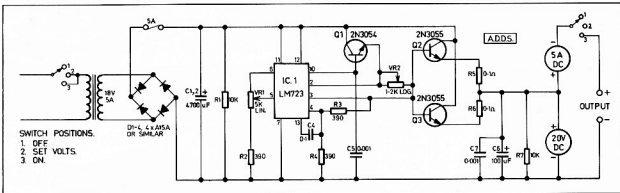


FIG. 1.

promise in this regard. The circuit is based on one in the National Semiconductor literature,<sup>1</sup> and, in the form described will deliver better than 5 amps at up to 15 volts, with current limited from 0 to 5 amps, fully variable.

The circuit is based on the LM 723 integrated circuit, which is a DC regulator IC. Note that in the discussion that follows, the pin numbers that are used are for the DIL package. If the metal can type is used, all the pin numbers are different.

The chip supplies a reference voltage, temperature stabilised, of typically 7.15V at pin 6. A voltage divider, RV 1 and R 2, taps off a variable voltage between 0.7 and 7.15V and applies this to pin 5. Output feedback is combined with this voltage in an error amplifier to give an output voltage on pin 10 of about 2.2 times the voltage reference, i.e. between 1.5 and 15 volts. The chip is capable of delivering currents of up to 150 mA from pin 10.

Output from this point is fed to the base of a 2N3054 transistor, Q1, in an emitter follower configuration. The output of this transistor, which can be a current of up to half an amp, is fed to the bases of a pair of transistors in parallel, Q2 and Q3,

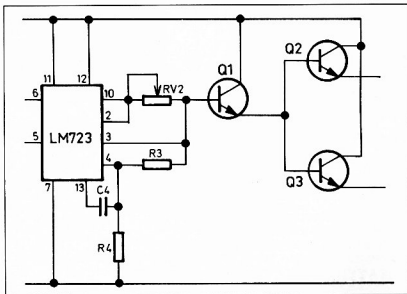


FIG. 2. MODIFICATIONS TO CURRENT LIMITING



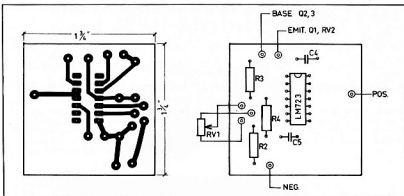


FIG. 3. CIRCUIT BOARD AND COMPONENT LAYOUT

and (iii) are both acceptable, but the position used was found to be the best in practice. Should you wish to use position (iii) the modifications are shown in figure (ii). This has some advantage in that the power dissipation in the potentiometer is lower than in the other position. Both positions, however, have a sufficiently low current to enable a normal carbon potentiometer to be used. A logarithmic taper potentiometer is used to give a better spread of current range on the calibration, but the calibration is reversed, i.e. the highest current is with the potentiometer anticlockwise. A reverse log potentiometer, if available, would put this around the other way.

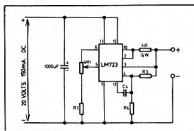


FIG. 4. 150 mA SUPPLY

#### CONSTRUCTION

The IC and the smaller components can be mounted on the printed circuit board as shown, or mounted on veroboard. The remaining components are best mounted

on tag strips or tied to the appropriate points.

The output transistors, and preferably the driver as well, should be mounted on large, efficient heat sinks, and insulated from the chassis. The metering shown is, obviously, optional. SW 2 as shown is a three position switch. The three positions given are 1. OFF, 2. SET VOLTS, in which all circuitry is on and the voltage may be adjusted to the desired value, but the output terminals are still disconnected, and 3. ON, in which output is now connected to the terminals.

The current limiting may be calibrated on the front panel with reasonable accuracy. A version under development at present will have an additional switch position whereby the current limit may be set on the ammeter, and the ammeter will have several switched ranges. This will not add much to the overall complexity, and the modification may be published if sufficient interest warrants it.

The circuit board as shown is very versatile. As it is, with the addition of a couple of resistors, it can be used as a 150 mA supply by making the appropriate connections (see fig 4). Similarly, by the addition of a transformer with a higher rating and additional output transistors in parallel the maximum current could be increased to many times the original 5 amps.

If voltages above 15V are required, the whole circuit could be built above ground and a set of zener diodes switched in to raise the voltage; e.g. a 10V zener would

give a range of 11.5V to 25V, etc. Note that the voltage across the IC must not be allowed to exceed 35V.

A higher current version could perhaps be built to power an Atlas HF transceiver for less cost than the commercial power supply.

#### MEASURED PERFORMANCE

A study of the performance curves shown will indicate that the power supply puts up quite a creditable performance. The data was measured on the prototype, and verified by measurements on a second unit built to the same design by David, VK3ANP. At the full 5 amps, ripple was measured as 0.5V at a supply voltage of 15V, i.e. 3.3% ripple. Note that this was measured with the output virtually short circuited, no current limiting. At 4 amps, 15V, the ripple was 0.0025V, or 0.016%. At 3 amps the ripple was undetectable on a BWD 509 B oscilloscope. Analysis of the regulation curves shows that the regulation is about 3% or better, particularly at the higher voltage ranges.

A 30W two metre FM transmitter running on the power supply showed no hum present on the signal received at a range of 1 mile, on a listening test.

On three units constructed to date no problems have occurred, so the supply seems to be easy to get going.

#### REFERENCES

1. National Linear Integrated Circuits — National Semiconductor.
2. Linear Applications — National Semiconductor.

## TRY THIS

WITH THE  
TECHNICAL EDITORS

#### MODIFICATION TO THE TE-15 TRANSISTOR DIP OSCILLATOR

R. G. Farnsworth VK3BHJ

Here is a simple mod which allows true wavemeter operation with the TECH TE-15 transistor dip oscillator.

This relatively cheap device operates quite well as a "dip" meter for finding the resonant frequency of tuned circuits, but its performance as a wavemeter leaves a little to be desired.

By switching the 1K emitter resistor of the oscillator transistor in or out of circuit, normal or wavemeter operation is achieved (respectively). A miniature toggle switch was used and can be inserted in either side of the 1K, although the earthy side is suggested.

The beauty of this mod. is that the meter only deflects when there is RF present, e.g. no more varying oscillator level or false dips when you're looking for RF. The sensitivity control still works as such but tuning is broader with low sensitivity. ■

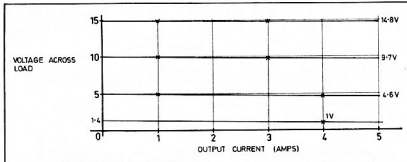


FIG. 5. VOLTAGE REGULATION

## TRANSVERTER MODEL MMT432/144

UTILIZING an IF of 144 MHz ★ 10 WATTS DRIVE or ½ WATT  
★ VOX OPERATED

This 432 solid state linear transverter is intended for use with a 144 MHz transceiver to produce a high reliability transceive capability. A 10 watt load and RF sensing network eliminates the need for any ancillary circuitry. A single coaxial connection is all that is required between the transverter and the associated 144 MHz transceiver.

A wide range of applications is offered by this MMT432/114 transverter, which by virtue of its linear mode of operation will enable 144 MHz SSB, FM, AM or CW equipment to be used at 432 MHz.

**Simply connect direct to your 2 metre rig, 12 volt supply, fit 70 cm antenna for instant SSB, FM, AM, CW operation.**

**FEATURES:** High quality double-sided glass fibre printed board ★ Highly stable zener controlled oscillator stages ★ PIN diode aerial changeover relay with less than 0.2 dB through loss ★ Extremely low noise receive converter, typical 3 dB ★ Separate receive converter output gives independent receiver facility ★ Built in Automatic RF VOX with override facility ★ Built in 10 watt 144 MHz termination, adjustable attenuator for ½ watt ★ Use of the latest state of the art Power Amplifier transistors provide reliable 10 watts continuous output.

MODEL MMT432/144 — Price \$260

## NEW RELEASE — TRANSVERTER

### MODEL MMT432/28S

**Features extended coverage for Oscar 8.**

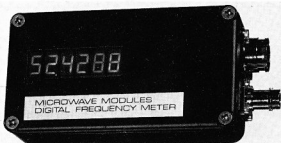
Second Crystal Oscillator gives two ranges: Low, 432-434 MHz — High, 434-436 MHz. Programming available to either Transmit/Receive both Low, both High, or a mixture of the two. Adjustable Level is now provided by an input potentiometer. Optional RF VOX.

Power Output 10 watts minimum ★ 28 MHz IF ★ Drive 1 mW to 500 mW ★ Aerial Changeover by PIN diode switch ★ Modern Microstrip Techniques ★ Power requirements 12 volt nominal at 150 mA 2.5 amp. peak ★ Case size 187 x 120 x 53 cm ★ Spare 432 input socket.

MODEL MMT432/28S — INTRODUCTORY PRICE: \$235.



MMT432 TRANSVERTER



## 500 MHz COUNTER

### SPECIFICATION

Digit Height	10 mm
Display Width	45 mm
Case Size	111 x 60 x 27 mm
Frequency Ranges	0.45 - 50 MHz, 50 - 500 MHz
Sensitivity	Better than 50 mV RMS over 0.45 - 50 MHz. Better than 200 mV RMS over 50 - 500 MHz
Input Connector	50 ohm BNC
Input Impedance	200 ohm approximately
Power Connector	5 pin 270 deg. locking DIN socket (supplied with plug)
Power Requirements	11 - 15 volts DC at 300 mA approximately

Model MMD050/500 — 500 MHz Counter, \$175

## LINEAR AMPLIFIERS

FOR 70 CM — 90-100 WATT

AVAILABLE SHORTLY

## New Release — 6 METRE MOSFET CONVERTER

**FEATURES** 24 MHz LOCAL OSCILLATOR OUTPUT FOR TRANSVERTER USE.

Input Frequency: 52-54 MHz  
L.F. Output Frequency: 28-30 MHz  
Typical Gain: 30 dB  
Noise Figure: 2.5dB

Typical image rejection: 65dB  
Crystal Oscillator Frequency: 24 MHz  
Power requirements: 12 volt ± 25% at 35 mA.

MODEL MMC52/28LO — Price \$49.00

**2 METRE VERSION — WITH 116 MHz LOCAL OSCILLATOR OUTPUT FOR TRANSVERTER USE.**

MODEL MMC144/28LO — Price \$49.00

## NEW READY-TO-OPERATE MODULES AVAILABLE IN THE SALES PROGRAM OF VHF COMMUNICATIONS

### 1296 MHz CONVERTER

Microstrip line, Schottky diode mixer.  
IF: 28-30 MHz or 144-146 MHz.  
Noise figure: typ. 8.5 dB.  
Overall gain 25 dB. Price: \$65

### 432 MHz CONVERTER

2 silicon pre-amplifier stages. MOSFET mixer. All UHF circuits in microstrip technology.  
Noise figure: typ. 3.8 dB.  
Overall gain: typ. 30 dB.  
IF: 28-30 MHz or 144-146 MHz 9-15 V 30 mA. Price: \$51.

### 144 MHz MOSFET CONVERTER

Noise figure: typ. 2.8 dB.  
Overall gain: typ. 30 dB.  
IF: 28-30 MHz, 9-15 V 20 mA.

Price: \$45

### VARACTOR TRIPLER 432/1296 MHz

Max. input at 432 MHz: 24 W (FM, CW) - 12 W (AM).  
Max. output at 1296 MHz: 14 W.

Price: \$74

Pack and Post \$1

All modules are enclosed in black cast-aluminium cases of 13 cm by 6 cm by 3 cm and are fitted with BNC connectors. Input and output impedance is 50 ohms. Completely professional technology, manufacture, and alignment. Extremely suitable for operation via OSCAR 7 or for normal VHF/UHF communications.

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

ONWARDS forwarding. Please add sufficient for freight or postage, excess will be refunded.

Australian Distributors for Microwave Modules Limited:

# AMATEUR ELECTRONIC IMPORTS

P.O. BOX 160, KOGARAH 2217, N.S.W.

PHONE: (02) 547 1467



# Mini-Mobile/Base Station **COMPACT 120 WATT** 80 thru 10m TRANSCEIVER

## FT-75B High power, for General use. FT-75BS Low power, for Novice use



Even the compact and sports car enthusiast can enjoy all band, SSB mobile operation, with the FT-75B "Mini-Mobile" transceiver. Features include a 120 Watt transmitter with provision for three, variable crystal controlled frequencies on each band; as well as provision for external VFO operation. The FT-75B is all solid state except for the final and driver stages and includes a built-in noise blander and squelch circuit.

The FT-75BS has one final tube removed and PS transformer tapped to reduce power to approx. 30W PEP output. When full call is obtained the set can be re-modified back to original condition.

### TECHNICAL DATA — FT-75B

#### GENERAL

**Frequency Range:** 80 M 75 KHz segment, 40 M 100 KHz segment, 20 M 150 KHz segment, 15 M 240 KHz segment and 10 M 400 KHz segment.

**Modes:** Upper Sideband for 20, 15 and 10 meter bands. Lower Sideband for 80 and 40 meter bands. CW for all bands.

**Frequency Control:** Crystal controlled VFO with 3 channels per band.

**VFO Coverage:**  $\pm 3$  KHz for 80 M,  $\pm 3$  KHz for 40 M,  $\pm 3$  KHz for 20 M,  $\pm 5$  KHz for 15 M and  $\pm 6$  KHz for 10 M.

**Antenna Impedance:** 50 Ohm unbalanced.

**Size:** 210(W) x 80(H) x 300(D) m/m.

**Weight:** 3.8 Kg.

#### RECEIVER

**Sensitivity:** 0.5  $\mu$ V for 10 dB Noise plus Signal to Noise Ratio on 14 MHz for SSB and CW.

**Selectivity:** 2.3 KHz nominal bandwidth at 6 dB down, 4.5 KHz at 60 dB down on SSB and CW.

**Harmonic & Other Spurious Response:** Image Rejection better than 50 dB. Internal Spurious Signal below 1  $\mu$ V equivalent to antenna input.

**Automatic Gain Control:** AGC threshold nominal 1  $\mu$ V. Attack time 5 millisecond and release time 1.5 seconds.

**Audio Output:** 2 Watts at 4 Ohm impedance.

**FT-75B**, inc. one crystal for each band 3565, 7085, 14,200, 21175 28550 kHz, mic. & inst. book

#### TRANSMITTER

**Input Power:** 120 Watts PEP on SSB and 100 Watts on CW at 50% duty cycle. (Slightly lower on 10 meter.)

**Microphone:** 50 K Ohm dynamic type.

**Carrier Suppression:**  $-40$  dB.

**Sideband Suppression:**  $-40$  dB.

**Spatial Radiation:**  $-40$  dB.

**Distortion:**  $-30$  dB.

**Final Tube:** 12GB7 x 2.

JAS7576-23

**FP-75B or BS, AC PSU**

**DC-75B or BS DC PS**, inc. mobile mounting bracket

All prices include S.T., Freight extra. Prices and specifications subject to change.

**90 DAY WARRANTY**



**ELECTRONIC SERVICES**

60 Shannon St., Box Hill North, Vic., 3129. Phone 89 2213

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FRED BAIL VK3YS

JIM BAIL VK3ABA



## CRYSTAL FILTERS - FILTER CRYSTALS - OSCILLATOR CRYSTALS

### SYNONYMOUS for QUALITY and ADVANCED TECHNOLOGY

Listed is our well-known series of 9 MHz crystal filters for SSB, AM, FM and CW applications.

Export inquiries welcomed



**KVG**

Filter Type	XF-9A	XF-9B	XF-9C	XF-9D	XF-9E	XF-9M	XF-9NB
Application	SSB-Transmit.	SSB-Receive	AM	AM	FM	CW RTTY	CW RTTY
Number of Filter Crystals	5	8	8	8	8	4	8
Bandwidth (6dB down)	2.5 kHz	2.4 kHz	3.75 kHz	5.0 kHz	12.0 kHz	0.5 kHz	0.5 kHz
Passband Ripple	< 1 dB	< 2 dB	< 2 dB	< 2 dB	< 2 dB	< 1 dB	< 0.5 dB
Insertion Loss	< 3 dB	< 3.5 dB	< 3.5 dB	< 3.5 dB	< 3.0 dB	< 5 dB	< 6.5 dB
Input-Output	Z <sub>i</sub>	500 $\Omega$	500 $\Omega$	500 $\Omega$	1200 $\Omega$	500 $\Omega$	500 $\Omega$
Termination	C <sub>i</sub>	30 pF	30 pF	30 pF	30 pF	30 pF	30 pF
Shape Factor	(6.50 dB) 1.7	(6.60 dB) 1.8	(6.60 dB) 1.8	(6.60 dB) 1.8	(6.60 dB) 1.8	(6.40 dB) 2.5	(6.60 dB) 2.2
		(6.80 dB) 2.2	(6.80 dB) 2.2	(6.80 dB) 2.2	(6.80 dB) 2.3	(6.60 dB) 4.4	(6.80 dB) 4.0
Ultimate Attenuation	> 45 dB	> 100 dB	> 100 dB	> 100 dB	> 90 dB	90 dB	> 90 dB
Price	\$31.95	\$45.45	\$48.95	\$48.95	\$48.95	\$34.25	\$63.95

In order to simplify matching, the input and output of the filters comprise tuned differential transformers with the "common" connections internally connected to the metal case.

Registration Fee: \$2.00; Air Mail: 31c per 1/2 oz. Shipping weights: Filters 2 oz. ea., Crystals 1/2 oz. ea. All Prices in U.S. Dollars.

#### Matching Oscillator Crystals

XF900 Carrier	9000.0 kHz	\$4
XF901 USB	8998.5 kHz	\$4
XF902 LSB	9001.5 kHz	\$4
XF903 BFO	8999.0 kHz	\$4
F-06 Crystal Socket (HC 25/u)		\$50

**Oscillator Crystals** 50 kHz through 150 MHz available to order. Parallel resonant (30 pF) to 20 MHz. Series resonant above 20 MHz. Write for quotation to your requirements (include mechanical size & frequency).

#### Matching FM Crystal

Discriminators for XF-9F

	Freq.	Dev.	Slope	Price
XD-9-01	5 kHz	40 mV/kHz		\$24.10
XD-9-02	10 kHz	24 mV/kHz		\$24.10
XD-9-03	12 kHz	50 mV/kHz		\$24.10

**SPECTRUM INTERNATIONAL INC. Box 1084A, Concord, Mass. 01742 USA**

# FILAMENT SWITCHING FROM A DISTANCE

P. Renton VK4PV,  
20 Harold Street, Townsville 4810

**How to fit filament switching to a hybrid mobile rig without disfiguring the front panel.**

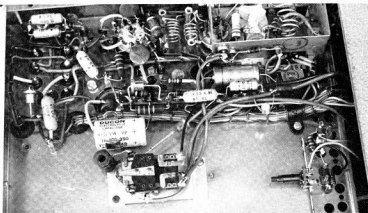
Several months ago, I permanently installed a 2 metre Pye Overland mobile rig in my car, with the battery supply taken from the cigarette lighter circuit. As most people seem to do, I once left the rig running all night and found in the morning that I had a very flat battery, which was most embarrassing.

In order to prevent this from recurring, I then re-arranged the supply to come from the vehicle "accessory" fuse. This ensured that the rig would run only when the ignition was switched on, or if the ignition key was turned to "accessory".

The Overland is completely transistorised except for the driver and final valves in the transmitter. The next logical step seemed to be to fit a panel mounted filament switch to further reduce current drain when not transmitting. This scheme was rejected, however, as I felt that there were already enough additional controls on the front of the unit. I then decided to design a relay operated system, and have been very pleased with the results.

In operation, the rig is now normally left switched on at the front panel, with the receiver operative all the time the car is

being used. When it is necessary to transmit, the PTT button on the microphone is pressed momentarily and then released for approximately 20 seconds to allow the filaments time to heat up. When the button is pushed, the panel lamp lights, indicating that the transmit mode has been selected, and the unit is operated normally from this time on.



Inside 2 metre Pye Overland showing installation of filament switch.

If it is desired once again to reduce the current drain, the set is switched off momentarily at the front panel and then on again. The transmitter filaments and panel lamp will now remain out of circuit until the PTT button is once again pressed momentarily.

The circuit is very simple, and I have shown the additional wiring as dotted lines (Fig. 1). As soon as the PTT switch is pressed, both relays RLA and RLB are energised. RLB then remains energised via its own hold-in contact RLB1 until such time as the battery supply is interrupted for any reason. From here on the valve filaments and the pilot lamp also remain energised via contacts RLB2. As soon as the PTT switch is released, RLA is de-energised, as diode D2 prevents RLA coil current from flowing through contact RLB1.

Relay RLB has almost full battery voltage applied to its coil while the PTT switch is closed, thus giving it a good pull-in force. To reduce long-term battery drain as far as possible, I included a 68 ohm limiting resistor in series with the hold-in contact. The value of this resistor should be determined experimentally to give secure holding-in of the relay at the lowest practical coil current.

In fitting the filament relay RLB, I chose to mount it on a small aluminium bracket which was then fastened beneath the chassis using two small self-tapping screws. This resulted in minimum disfigurement of the chassis with this particular type of relay.

As an indication of the benefits to be gained when using filament switching (whether by panel mounted switch or by relay), the standby current of my rig dropped from 800 mA to 38 mA after this modification. This makes it well worth the effort, particularly if operation for long periods in a WICEN net is a possibility. ■

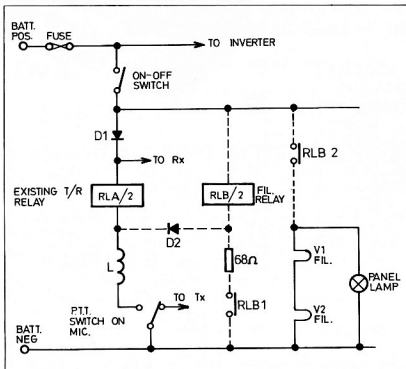


FIG. 1. Control relay circuit.

# DARWIN AMATEUR RADIO CLUB — POST TRACY PROGRESS

Trevor Lloyd, VK8ZTW  
Publicity Officer, DARC

The Darwin Amateur Radio Club wish to express their sincere thanks to those amateurs who assisted by the generous donation of \$1038.39, which was made available to restore an operating station at the club.

The equipment purchased from the fund were two IC-22As, FT101E and a HAM 2 rotator. This equipment has been labelled, "This equipment was purchased from funds donated by amateurs after Cyclone Tracy, December 1974."

Regular use is being made of the equipment and the rigs have been made available to members for outside club usage to maintain operational stations and extra 2 metre stations for fox hunts.

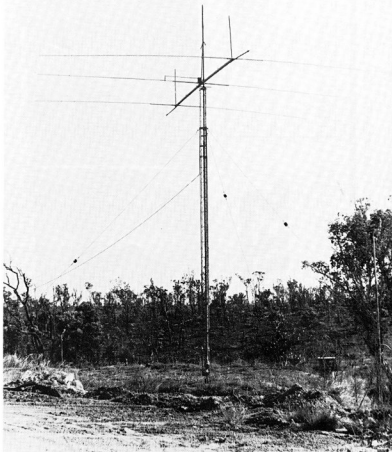
Owing to the brief nature of this entry in AR, it is anticipated that a detailed account of events regarding the restoration of the DARC since the cyclone will be forthcoming in a future issue. On the 7th of November, the Darwin Amateur Radio Club will have celebrated 11 years of successful achievement at their 132nd General Meeting. To commemorate this occasion, the members will be enjoying an anniversary dinner.

Furthering the interests of Amateur Radio in Darwin, the DARC will be presenting a display at the Northern Territory



Operating Centre at VK8DA

Communications Convention to be held at the Darwin Community College on the 3rd and 4th of December. The Minister for Posts and Telegraphs, Mr. E. Robinson, will be officiating at the opening. Also attending will be Mr. D. Williamson and Mr. D. Caudle from the Regulatory and Licensing Section; Mr. C. Hurst VK5HI) VK5 Divisional President and Mr. D. Wardlaw, WIA Federal President and Mr. M. Hurst-Meyers, National Director National Citizens Radio Association.



3-Element Full Size 20 Mx Beam — Gamma Matched.

Participants at the display will be Darwin Community College, branches of the armed forces, Telecom, Department of Transport, Overseas Telecommunications Commission and other Government Departments, Commercial and non-commercial interests.

The theme for the convention is the role communications play in the development of the Northern Territory, the training schemes available to the public in commercial and non commercial fields and

the benefits to the public of Amateur Radio through greater awareness will also be featured prominently.

The convention promises to be a tremendous success due to the co-operation of the Government, Military and Commercial interests.

The DARC hereby extend a warm welcome to all amateurs to attend this commemorative convention.

## TRY THIS

### 1296 MHz SSB

1296 SSB may not be as difficult as it sounds. Instead of varacting FM up to 23cm why not use the varactor to both

### WITH THE TECHNICAL EDITORS

multiply up from 576 MHz and mix up the output of your FT221 or TS700 on 144 MHz.

In Electron, March 1977, the following circuit was described by H. R. van Leeuwen PA0DBQ. He obtained an output


**EMONA electronics**

 ROOM 208/661 GEORGE STREET, SYDNEY, NSW PHONE: 212 4815  
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# NEW-NEW-NEW

## National *RJX SERIES*

For every hobby there is an "ultimate" unit. For the sports car enthusiast it's the Ferrari. For the amateur photographer, it's the Hasselblad. For the amateur radio operator it's the National RJX1011.



## A Unique New SSB/CW Transceiver For Amateur Communications

There is no substitute for quality, performance, or the satisfaction of owning the very best.

Hence, the incomparable National RJX-1011 amateur transceiver. The RJX-1011 covers all amateur bands 1.8-30 MHz (160-10 metres). It utilizes advanced Phase-Lock-Loop circuitry with dual gate MOS FETs at all critical RF amplifier and mixer stages. There's a rotating dial for easy band-scanning and an electronic frequency counter with digital readout and a memory display that remembers frequencies at the flip of a switch. And that's just the beginning.

Matching speaker unit RJX-S1011 and complete external VFO RJX-V1011 also available.

For further information and specifications write, phone or call in!

# NEW Robot Model 400

## All solid state digital random access memory SSTV SCAN CONVERTER

- ALL SOLID STATE RANDOM ACCESS MEMORY
- SLOW-TO-FAST AND FAST-TO-SLOW CONVERSION CAPABILITY
- SSTV PICTURE DISPLAY ON ANY STANDARD CCTV MONITOR
- FRAME FREEZE FROM ANY STANDARD CCTV CAMERA, BROADCAST VIDEO OR VIDEO TAPE SOURCE
- PERMANENT PICTURE STORAGE
- AUTOMATIC OR MANUAL TV FRAME SNATCH
- INTERNAL GRAY SCALE GENERATOR ADJUSTMENT STANDARD
- CAPABLE OF REAL TIME DISPLAY OF DIGITALLY PROCESSED FAST SCAN VIDEO



**NEW: Medium-Sized Ham Antenna Rotator — FU 400.**

Constructed for long trouble-free operation. 200 kg vertical weight capacity. Extra heavy duty disc brake that prevents wind-milling.

### NEW Model DX-555 Counter-Generator

**Generator:**  
440 kHz to 30 MHz in 3 ranges.  
Output displayed on counter and available at jack on rear panel 600 Hz modulation for AM receivers.

**Counter:**  
5 digit display, 7 digit readout capability. 10 Hz to over 30 MHz (250 MHz with prescaler). Input level 20m Vrms to 5 Vrms (Prescaler 200m Vrms to 2 Vrms). Base oscillator beats directly against WWV.

**NEW Counter-Generator**  
Two vital pieces of test equipment in one.



### DENTRON MLA-2500

DenTron Radio has packed all the features a linear amplifier should have into their new MLA-2500. Any Ham who works it can tell you the MLA-2500 really was built to make amateur radio more fun.

**NEW NATIONAL — RJX7011** — Unique SSB/CW 160-10 metres transceiver with dual digital readout and matching speaker and external VFO.

**TRIO KENWOOD: TS520S** — SSB/CW, 160-10 metres with optional digital read-out.

**TRIO KENWOOD: TS820S**, 160-10 metres digital read-out.

**TRIO KENWOOD: TS820**, 160-10 metres.

**TRIO KENWOOD: TS700A** — 144-148 MHz all mode transceiver.

**TRIO KENWOOD: TS600A** — 50-54 MHz all mode transceiver.

**TRIO KENWOOD: TR-7400A** — 144-148 MHz FM transceiver.

**YAESU MUSEN: FT101E** — 160-10 metres AM, SSB, CW transceiver.

**YAESU MUSEN: FT301 series**, 160-10m AM, SSB, CW transceivers.

### RECEIVERS:

**TRIO KENWOOD: R300** general coverage BCL receiver.

**YAESU MUSEN: FRG-7** general coverage Rx, Wadley loop system.

### INTRODUCING LINEAR AMPLIFIERS:

**DENTRON RADIO CO.: MLA-2500**, 160-10m linear amplifier.

**DENTRON RADIO CO.: MLA-1200** — 80-10m linear amplifier.

**DENTRON RADIO: 160-10L Superamp**, 160-10m linear amplifier.

**SCS: HF3-100 L2**, 3-30 MHz bi-linear amplifier.

**SCS: 2M10-80 L**, 144-148 MHz, FM/SSB linear amplifier.

**YAESU MUSEN: FL-2100B**, 80-10 metres linear amplifier.

### ANTENNAS:

**HUSTLER** — 4-BTV — vertical trap antenna.

**HUSTLER** — Mobile vertical trap antenna (80-10m).

### ANTENNA TUNERS:

**DENTRON MT-3000A**    **DENTRON 160-10AT**    **DENTRON 80-10AT**

### RF Preamplifiers for 3-30 MHz Band:

**Model SX-59** for use with transceivers.

#### SPECIFICATIONS:

Frequency range 3-30 MHz in 3 bands; 3-7, 7-14, 14-30 MHz

Gain 20 dB nom. (at 7 MHz), front panel variable control

Attenuator — 20 dB attenuation selectable from front panel control.

Impedance 50 or 75 ohm systems, UHF connectors on rear panel.

Power handling capability 100W thru relay contacts — Power supply built-in VAC fused supply — Semiconductors 3 FET — Size 67 (H) x 150 (W) x 146 (D) mm (2.64 x 5.91 x 5.75 in.) — Weight 1 kg (2.2 lb.). Switching requirements: requires external relay contact switching when used with transceivers. Remote contacts readily available from most amateur HF transceivers, including TS-510, TS-511, TS-520, TS-820, FT-101, FT-401, FT-200 & FT-201.



of 500mW PEP on 1296 MHz for inputs of 6 watts on 144 MHz and 3 watts on 576 MHz.

A varactor multiplier to 576 MHz was described in AR in April 1971. Suitably throttled back it would make a fine driver for the circuit shown.

Several days later (took time out for CW practice) back to the grindstone, and eventually the frequency reached 7 MHz. At one stage the frequency decreased between grinds, and I presumed that some moisture must have remained on the crystal. A final rinse with methylated spirits is recommended; I used dry cleaning fluid and this was an error as the crystal stopped oscillating. A good polish with Brasso, rinse, etc., restored activity, the final frequency being about 7006 kHz.

In conclusion, I cannot recommend the use of Ajax on mirrors as it spoils the glass; and neither would I undertake to move a crystal frequency more than a couple of hundred kHz. Now I would like to try lowering a crystal frequency by copper plating. More of that anon.

Sue VK8SU, from "Ground Wave", May/June 1977.

## INTERFERENCE IN COLOUR TELEVISION SETS

Some television sets are very susceptible to interference from the lower HF bands especially 3.5 MHz. This interference is very hard to eliminate and seems to come from interaction between the direct transmission—not harmonics—and the frequencies associated with the colour sub-carrier (4.4 MHz) frequency.

The television antenna picks up the 3.5 MHz signal and this gets directly into the set.

The solution is to prevent a path being available for the 3.5 MHz transmission and this can be done by using what is in effect a transmission line transformer as a choke. Obtain a toroid, the larger the better, and either wind the TV ribbon through it, making as many turns as possible, or alternatively do the same thing with the three core power flex. In the latter case a very effective toroid to use is the ferrite yoke which is used on some colour picture tubes. Also large toroids can sometimes be obtained from disposals and these are large enough to take a number of turns of normal three core cable.

In either case, the result is that there is no path from the TV antenna through the set to earth through the flex for the RF, and a potential cannot be built up across the internal parts of the set which will interfere with the colour frequencies.

This solution has also proved useful in the case of interference from strong local broadcast stations.

## OUTLET PLUG FOR LOW VOLTAGE POWER SUPPLIES

With the increasing availability of transistorised gear, many hams are home-brewing low voltage power supplies for energising their mobile gear in the shack for test and/or base station operation.

If the power supply is fitted with a car type cigarette lighter receptacle the mobile gear can be energised via the lighter receptacle in the car or from the bench supply with a minimum of fuss.

Bruce L. McCubbin VK3SO.

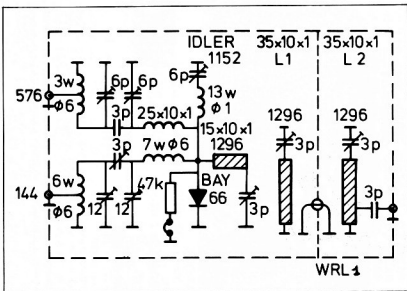


FIG. 1. Coils L1 and L2 are placed 8 mil. above the Chassis.

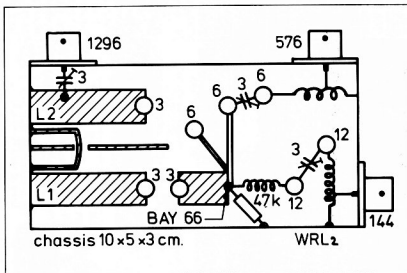


FIG. 2.

## THE GENTLE (?) ART OF CRYSTAL GRINDING

Presented with a crystal, frequency 6840 kHz, style FT-243 and stern warnings about grinding gently, I set to work cautiously on a mirror removed from the bathroom, this being the only handy bit of plate glass. The recommended practice for raising the frequency of crystals is to remove the crystal from its holder (of course) and grind the top side of the quartz plate on grade 200 wet and dry. Both sides of my crystal looked the same

(it was an old reference book) so I ground both sides.

Heeding warnings, I began cautiously, using Brasso — grind, rinse in water, dry, replace in holder and check frequency. No change! I progressed to using smokers' tooth powder — still no change. Then tried Ajax, which had an astonishing effect on the mirror, but none on the crystal frequency. Rubbing on a piece of wet and dry (on the mirror) had some effect and the frequency went up about 60 kHz after about 15 minutes grinding.



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# CONTESTS

**Kevin Phillips, VK3AUQ**

**Box 67, East Melbourne, 3002**

## CONTEST CALENDAR

### November

- 3-4 YLRL Anniversary Phone Party
- 5-6 RSGB 7 MHz CW
- 12-13 European RTTY Contest
- 13 Czechoslovakian Contest
- 19-20 WDDXA CW Contest
- 26-27 CQ WW DX CW Contest

### December

- 3-4 Spanish Phone Contest
- 10-11 Spanish CW Contest
- 11-11 APRIL 10 Metre Contest
- 10-11 Hungarian CW Contest
- 10-Jan-B ROSS HULL VHF/UHF MEMORIAL CONTEST

### January

- 27-29 CQ WW 160 CW Contest

## CZECHOSLOVAKIAN CONTEST

0000 to 2400 GMT Sunday November 13.

All bands 1.5 to 28 MHz may be used, both phone and CW. The same station may be contacted on each band for QSO and multiplier credit. Crossband and crossmode contacts not permitted.

Classifications are: single operator, single band and all band, and multi-operator all band only. Exchange RS(T) plus 2 figures indicating your ITU Score 1 point per QSO, 3 points if it's a Cliché station. Multiply total QSO points by sum of ITU zones worked on each band for your final score. Own country may be worked for multiplier credit, but not for QSO points.

Certificates will be awarded to the top scoring station in each class in each country.

Use a separate log for each band, include a summary sheet and a signed declaration that rules have been observed.

Send entry to the CENTRAL RADIO CLUB, PO Box 68, 113 27 Praha 1, Czechoslovakia. Mailing deadline is December 31st.

## ROSS HULL VHF/UHF MEMORIAL CONTEST

**RULES 1977-78**

The Wireless Institute of Australia invites Amateurs and SWLs to join in this annual contest which is held to perpetuate the memory of Ross Hull, who did so much to further VHF/UHF.

A Perpetual Trophy is awarded annually for competition between members of the WIA, and is inscribed with some details of the man the contest honours. The name of the winning member of the WIA for each year is inscribed upon the trophy and that member also receives a suitably inscribed certificate.

## OBJECTS

Amateurs from Australia and Territories will endeavour to contact as many other Amateurs as possible under the following conditions.

## DATE OF CONTEST

10th December 1977, 0001 GMT to 08th January 1978 2400 GMT.

## DURATION

Any seven calendar days within the dates mentioned above which need not be consecutive. These periods may be chosen at the competitor's convenience. A calendar day is from 0001 GMT to 2400 GMT.

## RULES

1. There are two divisions, one of 48 hours duration, and the other of 7 days duration. In the 7 day division there are four sections.

- (a) Transmitting Open
- (b) Transmitting Phone
- (c) Transmitting CW
- (d) Receiving Open

An open log is one where points are claimed for more than one mode, i.e. Phone, CW, RTTY, ATV, SSTV, (AM, FM and SSB are grouped together as phone).

In the 48 hours division, the best score over any consecutive 48 hour period is the winner.

In the 7 day division, the best score over any seven days (not necessarily consecutive) is the winner.

2. Any Amateur operating fixed, mobile or portable within the terms of his licence may participate.

3. All Amateur VHF/UHF bands may be used, but crossband contacts are not acceptable. At any one time, single frequency operating only is permitted. Cross mode contacts are permitted.

4. Amateurs may enter for any one of the sections and either or both divisions. 7 day certificate winners are not eligible for 48 hour awards.

5. Two contacts per band per day, irrespective of mode are permitted provided that at least two hours elapse from the previous contact with that station on that band.

6. Logs from a multi operator station are not acceptable. One operator only may operate a station at any one time, and must submit a log for his own operation.

7. Entrants must operate within the terms of their licences.

8. The exchange of RS or RST reports with a serial number starting at 001 and advancing by 1 for each successive contact will be proof of contact.

9. Entries should be set out on Quarto sheets, using one side of the paper only, and must be forwarded to reach the Federal Contest Manager, Wireless Institute of Australia, Box 67, East Melbourne, 3002, in time for the last opening of logs on Friday, February 17th. Envelopes should be clearly marked Ross Hull Contest. Early logs will be appreciated.

10. Scoring will be based on the following table:

Freq.	Less than 200 kHz	More than 200 kHz	More than 200 kHz
200 kHz	within Call Area	other Call Areas	
52	2	5	10
144	2	5	10
432	5	15	25
576	10	25	50
1296 and 20 above	50	100	

Bonus points: Each new call area contacted, 20 points, once only per band per day (including own call area).

Operation via active repeaters or translators not permitted for scoring purposes.

11. Logs should be set out as in the example and must carry a front sheet showing the following information:

- Name
- Address
- Section
- Call sign
- Claimed 7 day score
- Operating days
- Operating dates
- Highest 48 hours score
- Operating period

Declaration — I hereby certify that I have operated in accordance with the rules and spirit of the contest.

Comments

12. All times to be logged in GMT only.

13. Awards: Certificates will be awarded to the highest scorers in each section, in each call area. Additional certificates will be issued to contestants who break any VHF/UHF record during the contest.

The VK contestant who returns the highest score in the transmitting section, and who is a member of the WIA will have his name inscribed on the trophy which will be held by his Division for the present period.

Certificates will be awarded to the highest 48 hours entrants in the transmitting section, who have not won a 7 day certificate.

## RECEIVING SECTION

1. SWLs only may enter for this section.

2. Contest times and logging of stations will be the same as the transmitting section except that there will not be a 48 hours section.

3. Logs must show the call sign of the calling station, the serial number given, and only the call sign of the other station. Scoring will be as for transmitting stations.

4. Any scoring contacts may be logged. There is no limit to the number of times that a station may be logged provided that serial numbers are given.

5. The logs for any 7 days may be submitted and the winner of the section will be highest score.

6. Certificates will be awarded to the highest scorer in the contest, and if sufficient interest is shown, to state winners.

## GENERAL

It is preferable that complete logs be submitted as soon as possible to checking, but contestants must clearly show their best 7 days or 48 hours.

Enjoy yourself in another friendly contest, and remember — it is only as friendly as you make it.

## EXAMPLE OF A VK3 TRANSMITTING LOG

Date/time GMT	Band MHz	Emission	Call sign	RST sent	RST rec.	Points	Bonus
Dec. 18							
0156	52 SSB	VK4DT	59001	58037	10	20	
0207	52 CW	VK4XA	569002	57012	10	—	
0214	44 SSB	VK7ZAN	58003	58026	10	50	
0216	432 SSB	VK3ZBB	59004	59042	5	—	
0320	1296 SSB	VK3ATN	53005	52023	50	20	

## WESTLAKES NOVICE CONTEST

Westlakes Radio Club announces a new contest for all novice and fully licensed radio amateurs. The contest will take place on the 10th and 11th December, 1977 from 0900 GMT on 10th to 0759 GMT on 11th December, 1977.

## OBJECTS

To encourage contest working between amateur stations in Australia and New Guinea during a 24 hours period with special emphasis on contacts with Novice and Radio Club stations.

## RULES — STATIONS ELIGIBLE

All VK and P29 stations licensed for amateur operation in the 80, 15 and 10 metre band may take part. Calls within and outside the call area of the calling station are eligible. Except for Radio Clubs, no multiple operator working is allowed.

## BANDS

All the 80, 15 and 10 metre allocations may be used but Novice operators must observe the band limitations outlined in their licence. No cross band operation allowed but cross mode operation is allowed. Contacts may be made phone or CW.

## SCORING

**Full Call Operators:** For contacts with other full call stations: 2 points per contact; with Novice call stations: 5 points per contact; with Radio Clubs: 10 points per contact.

**Novice Call Operators:** For contacts with other Novice stations: 5 points per contact; with full call stations: 2 points per contact; with Radio Club stations: 10 points per contact.

**Listeners:** For Novice to Novice contact: 5 points; for full call to novice or novice to full call: 2 points; for full call to full call: 2 points; for contacts in which a Radio Club is involved: 10 points; all 10 metre loggings: 10 points.

\*All contacts on 10 metres are worth 10 points irrespective of call being worked.

## CALLING PROCEDURE

Stations should call "CQ Novice Contest" on phone or "CQCN" on CW. Stations may be worked once only per band per mode.

## \*FOR ALL 10 METRE CONTACTS ONLY

\*Stations may be worked once per mode each clock hour, e.g. a station may be worked at 0158 and again at 0201 but then not again until 0301.

Consecutive contacts with the same station may be worked on phone and CW provided that the second contact is commenced before the end of the clock hour, e.g. VK2NZZ works VK7NZZ on phone at 0258 and they say "go to CW". The CW contact commences at 0259.40 but does not end until 0301. This is a valid call in the clock hour 0200-0300.

## EXCHANGES

Telephone stations should exchange five (5) digit number consecutively in chronological order commencing with —001. The first two numbers would indicate signal strength and readability e.g. 5 by 9. CW stations should exchange six (6) digit numbers in order commencing with —001. The third number in this case would be to indicate tone. Listener stations should log both numbers and call sign in an exchange. Radio Clubs will add "C", e.g. 59023 C.

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CA3028A	CD4030	CD40175	LM389K	MC4044P	ULN2209
CA3035	CD4031	CD40192	LM555CN	OM802	ULN2111
CA3039	CD4035	CD40194	LM555H	SAJ110	74C00
CA3046	CD4040	CD40195	LM556N	SAK100	74C02
CA3053	CD4041	DM8097 1.90	LM562B	SO305DE	74C04
CA3059	CD4042	HEF see "CD"	LM565N	SO306DE	74C10
CA3060	CD4043	LM0070	LM566CN	SL405A	74C14
CA3079	CD4044	LM1114H	LM567CN	CD425A	74C20
CA3080	CD4045	LM301AN	LM709N	SL437D	74C85
CA3081	CD4046	LM301CN	LM710CN	SL440	74C86
CA3082	CD4047	LM304H	LM712CN	SL402	74C90
CA3083	CD4049	LM305AH	LM723H	SL447	74C154
CA3086	CD4050	LM307N	LM723N	SL449	74C160
CA3089E	CD4051	LM308V	LM725N	SL505C	74C162
CA3090G	CD4052	LM309K	LM733CH	SL612C	74C174
CA3091	CD4053	LM310N	LM733N	SL613C	74C192
CA3120E	CD4068	LM311A	LM741CH	SL620C	74C001
CA3127E	CD4068	LM311H	LM741CN	SL621C	74C925
CA3128E	CD4069	LM312H	LM747CH	SL623C	80C95
CA3130T	CD4070	LM317K	LM747CN	SL622C	MB9C
CA3140T	CD4071	LM318N	LM748CN	SL624C	AL5352
CA3600	CD4072	LM319H	LM1303N	SL630C	GL4484
CD4000	CD4075	LM319N	LM1310N	SL640C	GL5253
CD4001	CD4076	LM320K	LM1458N	SL641C	RL4484
CD4002	CD4078	LM320T	LM1489N	SL645C	RL5023
CD4006	CD4081	LM322N	LM1489N	SL901B	ULN2007
CD4007	CD4082	LM323K	LM1496N	SL917B	ULN2008
CD4008	CD4085	LM324N	LM1808N	SL1310	T2-20
CD4009	CD4086	LM325N	LM3028	SL3046	T-37
CD4010	CD4093	LM326H	LM3046	SP8505	T-50
CD4011	CD4502	LM339N	LM3086	SP8515	0001
CD4012	CD4503	LM340K	LM3900	TAA300	NSN71
CD4013	CD4510	LM340T	LM3905	TBA570	NSN74
CD4014	CD4511	LM349N	LM3909	TBA700	TIL306A
CD4015	CD4514	LM358N	MC1035P	TBA810A	11C90
CD4016	CD4515	LM370H	MC1312P	TL1750A	95H90
CD4017	CD4516	LM371N	MC1314P	TCA220	2102-2
CD4018	CD4516	LM372H	MC1315P	TCA290A	2513N
CD4019	CD4519	LM372N	MC1350P	TCA420A	S1883
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7419	74150	74LS27	AD149	MPF105	MPF103
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7429	74181	74LS75	TP2355	TP2355	TP2355
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7465	74224	74LS118	TP834		
7466	74225	74LS119	TP835		
7467	74226	74LS120	TP836		
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STB 80

## CONTEST CLASSES

There are four classes in the contest — A: Novice/full calls working phone; B: Novice/full calls working CW; C: Novice/full calls working open; D: Listeners.

## MULTIPLIERS

Notwithstanding the class of operation if ten (10) or less than 20 stations \*\* are worked or heard on CW a multiplier of 1.2 may be applied to the total points score.

If 20 or more stations \*\* are worked or heard on CW a multiplier of 1.5 may be applied to the total points score.

\*\* On 10 metres it is possible to work a station more than once. Hence the score of stations worked for the purpose of the multiplier can only include the same call sign once, e.g.:

CW contact No. 19 VK2NZZ works VK2NZY at 0658. CW contact No. 20 VK2NZZ works VK2NZY at 0702 and has no more CW contacts. The multiplier (1.2x) may then only be applied since the CW station count is 19, not 20.

## SUBMISSION OF LOGS

Logs containing the details: Station, time, band, mode, and sent, No. read, points tally should be made up with a front cover which contains the following details:

1. Name of operator and call sign.
2. Address.
3. Class for which entry is made.
4. Station worked (a) phone (b) CW.
5. Points claimed (actual).
6. Multipliers (if any).
7. Total points claimed.

## DECLARATION

This declaration should also be made: "I have operated my station in accordance with the licence requirements and the rules and spirit of this contest." Signed and dated.

Logs should be sent to the Contest Manager by certified mail.

To:

Westlakes Radio Club,  
Novice Contest Committee,  
Box 1,  
Terahs, 2284

Log entries close 15th January, 1978. Late entries will not be accepted.

The decisions of the committee are final and no correspondence will be entered into regarding the contest.

## CONTEST AWARDS

Certificates will be awarded as follows:

Highest Score:

Novice Phone  
Novice CW  
Novice Open  
Full Call Phone  
Full Call CW  
Full Call Open  
Radio Club Phone  
Radio Club CW  
Radio Club Open  
Listener Phone  
Listener CW  
Listener Open

A miniature replica certificate will also be issued to all stations and listeners who take part in the contest indicating their participation. Results will be notified in the February issue 1978 of the Westlakes Radio Club Newsletter and in the April issue of Amateur Radio.

# LETTERS TO THE EDITOR

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.

The Editor,  
Dear Sir,

## PIRACY PREVALES

I would like to refer readers to AR of August 1977, page 5, and I quote from the special announcement therein: "The general view is that a percentage of CBers will feel the need to expand their interests beyond the narrow confines of their service".

With this statement I most wholeheartedly agree. I do not however agree with the ensuing comment that the Novice licence is seen as the solution to cater for this interest. Obviously the "Pirate" response to the situation is to rush in and lay out a few hundred dB on a rig to get him out of the "narrow confines" of his band. Whilst I agree, a large number of keen enthusiastic applicants are now working their way towards Novice and or full tickets as a result of a first bleeding in CB radio, unfortunately these comparative few are far from being representative.

Let us face it from the day the authorities announced the impending legality of the CB service that band has been a shambles. Anyone who cares to listen to the herd of channel switch flickers on 11 metres hears pouring forth the idiot jibberish, inanities, profanities and hogwash of thousands of untrained uneducated and irresponsible button pushers. Those pirates of long standing, former users of the CB service are retreating, shuddering at the mess their nice little slice of spectrum has become.

The natural progression is for frustrated CB ops to obtain equipment to put them on other bands where spectrum space is less cluttered. In recent months I have heard everything from frustrated Novice "failures" driving their FT101s protestingly up and down 80m, ORM-ing all and sundry, to undisciplined CB/CB QSOs on 80.

The most recent and glaring example of invasion of amateur territory was on Saturday, 2nd December, when at least two stations of indeterminate identification and QTH spent most of their afternoon calling Q VHF CB on both RCH.2 and RCH.8 (VKM/RML/RGL respectively). Obviously these people have been able to purchase equipment fitted with rapier crystals and probably the usual simplex channels. The problem is as always, there is no law against buying equipment, only against using it. The authorities either cannot or will not police the situation, as their track record with 27 MHz indicates.

Yet the answer is within their grasp: sales of transmitting equipment to licensed recipients on production of licence, photo and signature on licence, and that is that. It is obvious that a man who buys an FT101 or an IC22 does not want it to decorate his cocktail cabinet. The current crop of equipment vendors have no excuses left now, the CB-ers had their way due to proliferation of equipment by these people until every Tom, Dick and Harry is in on the sales of CB radio. Meanwhile the legitimate amateurs have lost a band. Do we now all buy by white sales of 2 meg and amateur equipment skyrocket into a million dollar industry and our bands become gaggles of squalling anonymity like 11 metres?

I trust that anyone, amateur or not, in the business of retailing two way communication equipment who continues to provide unlicensed recipients with other than CB equipment should be named, so that those amateurs who feel strongly about this situation may direct their business elsewhere. It is time that the Institute took a stand and that its members stood behind it to pressure legislation to prevent sale of equipment in the random manner existing at the moment.

I for one will volunteer to send a copy of this letter to my local M.P. to illustrate the potential developing problems.

Max Stark VK3APZ.

(Editor's Note: The Institute's opposition to the sale of equipment to unlicensed persons has been documented in AR many times over the past several years.)

The Editor,

Dear Sir,

The editorial in September AR emphasizes the futility of organisations representing amateurs throughout the world. The Radio Branch in this country has always been readily available for amicable discussions. Niggling in that area in editorials is to be deplored.

There seems to be little point in negotiating for additional privileges at WARC 79, whilst doing nothing to preserve the frequency allocations presently available.

Throughout the world, all active amateurs are aware that the greatest single handicap to current HF amateur operation is the 14 MW Russian "Woodpecker". This blatant incursion into the amateur portions of the HF spectrum has been

with us for a long time, rendering whole bands unusable, but I have yet to see one editorial in any amateur publication denouncing it.

Further, I have yet to see any evidence that official objections have been lodged at any level.

Instead of belly-aching about unimportant inconveniences, start demanding LOUDLY that the current, internationally agreed, frequency allocations of amateurs be observed.

Convincing the convinced is easy but futile. Start convincing those in power that they must protest strenuously, at the highest possible level, at this flagrant violation of amateur privileges.

Yours faithfully,

N. W. Lavelle VK3ABH.

(It is hoped the writer has only reported his findings to the Inland Watch Co-ordinator. It has been noted from overseas sources that at least one Government has taken up this matter with the USSR Government but there has not been too much improvement—Ed.)

The Editor,

Dear Sir,

## CB RADIO

Well now we have these pests all over TV Channel 3 here in Newcastle. Most of the trouble is due to 3rd harmonic from 27 MHz clashing with the visual carrier on 86.25 MHz. With half a dozen CB-ers going for the lick of their lives the consequent degradation of the quality of the picture has to be seen to be believed.

Some of us are old enough to remember the days when a group of illegal operators causing endless TV would speedily be rounded up and put off the air.

The tragic part of this is that those people know perfectly well that they are causing this interference and couldn't care less. They blame everyone and everything except their own ignorance and apathy. I am sure that if the technical staff could know the 3rd harmonic could be suppressed.

I am one of those who has said all along the line that transmitting equipment should not be allowed into the hands of people with no knowledge of the principles.

We read in AR that the Institute has never opposed CB Radio. How true! How sad!

Yours faithfully,

Colin Yates, B.E. (VAG2)  
(Chartered Electrical Engineer)

The Editor,

Dear Sir,

## ROSS HULL VHF-UHF CONTEST

With reference to the letter by VK2ZFB, Mr. A. Birch, in September AR, I agree with most of his remarks on the contest and possibly that the image of the WIA has not been enhanced by the changes in contest rules.

There is an urgent need for a new set of rules to be drawn up for the contest based on the general rules for other contests. The decision on rules should not rest with any one individual, but with contest committees formed from volunteers from each State Division, and who are interested in this and any other contest. A submission from each State Division should be drawn into an overall set of rules and agreed to by a unanimous vote among the committees. Any changes to the rules should go through the same procedure.

Clearly it is too late for a change along these lines for this year's contest, but the machinery should be set up now to have everything completed in time for next year's Ross Hull.

To encourage greater participation I would like to see improvements to the contest rules along these lines:

1. Abolish the 7 day and 48 hour sections.
2. Introduce separate logs for each band.
3. Have separate SSB, FM, OPEN and CW sections on each band with entry restricted to one person.
4. Have sections for satellite contacts on 2m and 70cm.
5. Replace the bonus system with an overall multiplier for each band, each call area counting the same in the multiplier.
6. Introduce certificates for each State highest scorer on each band.

Yours sincerely,

Mike Hennessy VK7MC  
P.O. Box 52, Sorrell, Tasmania 7172.

The Editor,  
Dear Sir,

Regarding CB operating in the USA, I am regularly in contact with K6NS in Vista, California, both by ham radio and by letters. He has sent me some newspaper clippings from an LA newspaper, and the article gives quite an insight on the problems of CB radio in the West Coast of USA.

The thing I did not know was that it is illegal in the USA to communicate at distances greater than 150 miles and the penalty for doing so is a fine of \$100 per violation to maximum of \$500!

I think that a limitation on distances should be applied in Australia as well, because I get incensed when I hear several local CBers boasting of how much "DX" they've worked on 27 MHz, not just across Australia but with Japan, Canada and the USA.

It is ridiculous that we amateurs have to be technically competent to operate our equipment(s) and yet these non-technical persons can get away with it for the price of the licence fee.

Another point of interest in the latest K6NS letters concerns two new RF bills being pushed through the US Congress at the present time, which will force all TV and radio set manufacturers to install filters and traps at the factory before sale to the public, another good idea worth following up.

Certainly in my location I get a variety of spurious signals coming in via the antenna system of these can be attributed to local colour TV sets, so there are many quite urgent new pieces of legislation required in Australia to protect "hams" as well as TV viewers and radio listeners from interference.

So there you are, my first letter to the Editor is a little short; oh, hope I've made my thoughts a little clear.

Keep up the present high standard of the Journal. I read it through from cover to cover and also purchase a number of items extracted from the various publishers, so all very good work.

Fred Jenkins VK2BFJ

(The newspaper clipping was enclosed with Fred's letter, but is unfortunately a little too long to reprint. The article mentioned the proliferation of CB, illegal use, and of course the usual interference problems. Thanks, Fred, for the comments.—Ed.)

141 Hyde St., Nth. Rockhampton, 4701

The Editor,

Dear Sir,

I wish to support the remarks of Albert Birch, VK2ZFB, in the September issue of AR, regarding the Ross-Hull VHF Memorial Contest Trophy, and would suggest that the following rules be considered and applied:

1. That all those entering the Contest allocate themselves a specific number, to be used following the report given to the station worked. This would add to the competitive spirit of the Contest. With the present sequence number, everyone knows how the other fellow is going, and it gets too ahead many drop out, so do not send in a log. This was most noticeable in the 1976-77 Contest. Hundreds more were in the Contest than logs sent in.
2. That the winners in each 7 day and 48 hour section in each call area be issued a certificate, as was done in the past. This gives a great deal more incentive to make more contacts.
3. The present system of scoring be left as is and also the duration times of the Contest, of 7 days and 48 hours.

Previous to the last "Ross-Hull", VK4DO was the first in VK4 twice in both sections, and last time first in VK in both. For this I have been awarded three certificates and the Trophy only for 76-77, so when the Trophy goes back there is nothing for the hours and effort. Surely a certificate award is warranted for the winners.

To complete the list of winners mentioned in VK2ZFB's letter, the following were successful after VKSH: VK2ZER, 52KR, 3AKC, 4ZFB, 5SU (5 times).

It is to be hoped that the Contest Committee will give consideration to the suggestions offered.

Harold L. Hobler, VK4DO

The Editor,  
Dear Sir,

I refer to the article by Donald Pugh VK6DN on the "Teaching of Morse Code" and wish to thank him for his contribution to this important area of Amateur Radio training. I should like to submit further suggestions.

On the market are various Morse Training Schemes. Some involve "one-cassette" courses which I do not favour. I can see no alternative to "Cassette Courses" of 4 or 5 C-60 cassettes offering the Morse Alphabet and the Numerals in "small bites", each "bite" being taught and drilled and re-played by the students. As each new portion is learned, revisionary exercises should be added to include all the previously-learned letters and figures. Finally a stage will be reached where the student will KNOW all the symbols and will require only PRACTICE Cassettes to consolidate his receiving skills at the five or higher "words per minute" rate. There should, therefore, be a distinction between TEACHING (or LEARNING) cassettes and PRACTICE cassettes.

The attitude of the Instructor will largely determine the enthusiasm shown by the students. The Instructor should indicate that he really enjoys Morse operating.

One of the most important features of Morse instruction is the necessity for students to HEAR GOOD MORSE and to appreciate the good features LONG BEFORE they put a hard to Morse Key.

Even adult students in Theory, Regulations and Morse like to gain praise for their successes. This is sound educational practice. The use of PROGRESS WALL CHARTS has always been a worthwhile method of recognition — even with youngsters of 40, 50 and 60 years!

There is considerable difference of opinion regarding the necessity or desirability of using CODE GROUPS in practice sessions. Some instructors hammer the need to eliminate "journalising". Others maintain that the Novice and Amateur examinations consist of PLAIN LANGUAGE passages. Therefore, the writing of PRINTED CODE GROUPS under class conditions involves a skill (printing) that is irrelevant to the Telecom Examination. Ordinarily, the writing of legible shorthand should be the aim of Novice Morse instruction.

Instead of CODE GROUPS, I have found that FOREIGN LANGUAGE text serves to deter the journalising practice. This is PLAIN LANGUAGE material and should be handwritten. Students find this quite acceptable.

I find it preferable to pre-teach the whole of the Morse material and to reduce the amount of Key punching in front of the class. We have them for about 2½ hours per week — on ONE night. This makes it essential for them to "do their homework" and this can ONLY be done by the cassette or tape system.

Some overseas Morse training information suggests that two raw beginners should send to each other. NO WAY! Too much time can be lost later by efforts to eliminate the errors and bad habits gained during this period. In our Novice classes we can defer the sending instruction until the relevant skills have been developed at five words per minute.

After the Telecom Examinations candidates have a waiting period, during which Morse instruction should be continued. Simulated contacts can be practised on the Club Audio Oscillator set-up. Correlation between the Regulations, operating procedures and Morse can be developed. Club Amateur Stations can be put to good use by permitting the Novice members to operate on CW with other Stations — preferably by prior arrangements.

Shortly after the Novice examination should be regarded as the final goal — merely an incidental step on the way to Full Amateur status.

Morse instructors may be interested enough to obtain "AN INTRODUCTION TO MORSE CODE", which I prepared for the NSW Youth Radio Service. This contains a wide range of ideas and opinions on the teaching of Morse and is intended to stimulate discussion. It is NOT intended to be dogmatic. There is no BEST way to teach Morse. Individual Instructors should use trial and error methods, persisting with those that have proved successful and discarding those which experience shows to be unsuccessful.

R. C. Black VK2Y

(This letter has been shortened to assist early publication . . . Ed.)

## NOTE

Contributors of letters to the Editor are requested to keep contributions to no more than 300 words so that all may have a chance of being published . . . Ed.

## ATV NEWS

KEVIN CALLAGHAN VK3ZVJ  
PETER COSSINS VK3BFG

At the time of writing this column Kevin VK3ZVJ and myself have developed a working prototype for an ATV sign generator. Brief circuit details were provided for this unit in the last issue of AR. The prototype is an improved unit which accepts any video source and superimposes the data stored in two PROMs. Any 32 x 8 PROMs with suitable pinouts can be used in the circuit. Switching is provided to make possible a number of display variations. Kevin has also developed a programmer for the Harris 8256 and we can provide a service on the basis of no guarantees at a cost of \$5 if the PROM is supplied or \$10 if we supply the PROM. Circuit boards for this project will be available and enquiries for programming or boards can be made to the writer.

All revenue from this project will go towards meeting the cost of the proposed Melbourne ATV Repeater VK3RTV. PROMs have already been programmed and sent to Winston VK7EM and John VK3KG.

Motorola have a new RF device out which may be of interest to ATV-ers. It is a MRF646 and has a maximum output power of 45W. Les Jenkins VK3ZBJ is working on the design of a board for a pair of these devices as a linear amplifier. He estimates that the output power from this board would be comparable to a 4C25B with the advantage of no machine work in construction, wide bandwidth and a single 12V supply.

It is good to see a number of stations joining in on the 7.085 MHz liaison frequency after the VK3BWH broadcast on Sunday mornings. It is a nice way of exchanging ideas and keeping in contact with latest developments in each State.

With activity at a high level it may be possible to chop up some interesting DX this summer and possibly increase the current ATV record between the north coast of Tasmania and Melbourne.

P. J. Cossins VK3BFG

## 20 YEARS AGO

### OCTOBER 1957

1957 was the International Geophysical Year, with amateur radio stations throughout the world participating in the study of VHF propagation.

Federal Executive had the following to say on the Editorial page of October 1957 Amateur Radio.

It is fitting that an opportunity has come for Amateurs to take part in this aspect of IGY study on at least portion of the old 50-54 MHz band. Evidence collected by members of the WIA and submitted by Executive to the ABCG and Amateur Administration relative to the transfer of Amateurs to make room for TV channels. The problem of long distance interference was particularly stressed.

A new Amateur receiver was announced about this time. The Eddystone 888 was available from R. H. Cunningham Pty. Ltd. Perhaps when we complain about the present high price of amateur gear we should look back. The 888 was \$52.00.

Technical articles in October Amateur Radio included: part three of "90 RF Phase Shift Networks", by N. L. Southwell VK2ZF. EHT Without Tears, by M. Riley VK2AKZ. Xenon rectifiers were used in a voltage multiplying circuit to produce EHT for a modulation monoscope.

Code for 50 and 144 MHz was reprinted from an earlier QST article.

Eric Trebilcock BERS1919 that perennial SWL produced a bit of nostalgia with "Radio — 31 Years Ago".

With interest in the new mode of SSB running

high, a talk on the subject at the Victorian Division meeting was a sell-out. One of the reported statements made is interesting. "Rather elaborate gear is required in the Service and Commercial fields using this form of transmission, but the same high degree of perfection is not required on the Ham band". Well perhaps not, but times do change. ■

## IONOSPHERIC PREDICTIONS

Len Poynter VK3ZGP/NAC

Further to my comments last month there have been renewed bursts of activity throughout September and conditions generally have improved considerably. September was a month of spectacular solar fares and I think it can be said that "ol sol" is really going on the boil. The solar flux is rising significantly with an August mean of 84.93 and September up to 99.8. The A index whilst using spectacularly on occasions had means of 12.33 and 11.38 for the same period. Predictions for the solar flux for this period was 86 and 88. August being slightly lower but September quite a deal higher.

The smoothed sunspot mean for August was 29.9 with the running smoothed number for Feb. 77 being 18, a significant rise since July's 12.7. Predicted smoothed running numbers for Nov. - 32, Dec - 34, Jan - 36, Feb - 38, at Sept. 1, 1977.

From overseas reports it appears May and June provided sure signs of Cycle 21 beginning to emerge. With all the higher bands 28, 21, 14 MHz being the Hams Happy Hunting Grounds. Even those who don't chase DX found their logs filled up with stations in all continents, a different situation to the previous few years wallowing in the minima conditions. Many are getting excited at the prospect that the high might prove to be much earlier than originally expected and run as high as the old quoted 58 peak.

However these conditions exist at the commencement of a new period of high solar activity. Each burst of energy puts new life into a somewhat dispersed ionosphere and it follows that the good conditions soon find plenty of activity particularly in the portions of the bands with a high density population. On 21 MHz the US Notice CW portion is starting to sound like 27 MHz CW, only the CW GRM is quite high not to mention the JA phone area is now really alive. The VK Notice segment is now attracting considerable attention in anticipation of some juicy DX. Already 28 MHz is QSBing in and out almost daily to the joy of many.

It appears much interesting scientific information was obtained during the minima and you can be sure the forthcoming peak will be even more closely observed than previously. Ground level and satellite observations have added tremendously to our knowledge but many frustrating events still leave the experts bewildered. There are still many unexplained events awaiting analysis and perhaps an answer. There is so much data being produced that it will take a lifetime to even study it, let alone some of its implications. One thing seems certain that propagation predictions will undergo many changes in the years to come. However reliability is still not quite within the grasp of these experts but the degree of reliability is increasing yearly. One likely outcome of recent decisions is a world wide early warning network. Of course we already have ours but just how good we can tune the system up remains to be seen.

Don't forget WWV at 18 minutes past the hour gives the solar indices for yesterday GMT - it's invaluable for record keeping. High solar flux low A index is a sure way of knowing conditions are good. The local K index is a fair guide to forthcoming conditions K moving higher - poor, K dropping - good. Keep an ear out for it daily on 10 MHz or 5 MHz after 0600 UTC.

73s, good DX, VK3NAC

## AWARDS COLUMN

Brian Austin, VK5CA

P.O. Box 7A, Craters SA, 5152

### WCPRSO AND WACPR (IARC GENEVA)

General:

- The award is available to licensed amateurs.
- Contacts on and after 1/1/1968 are valid.
- Do not send QSL cards. A list showing full details of the contacts, including the ITU Zone, should be certified by a club official or two amateurs.
- The award is issued for 2 x SSB, all CW, all phone, all RTTY and for mixed modes.
- The award is issued to the operator and any number of call signs locations may be used, number of call sign locations may be used.
- The fee for the award is \$1 or 10 IRC. Stickers are available for a stamped envelope or 3 IRC.
- The address for application is -

Harry L. Whiting W2JXH,  
20 Pocono Place,  
Holiday City, Tom's River,  
N.J. 08753, U.S.A.

Note: In addition to the 75 ITU Zones, a further 15 areas are awarded by SEA Zones, giving a possible total of 90 Zones.

Rules: QSL cards are not required if contacts are made during the annual IARC CPR Contest.

Requirements: WCPRSO - The basic award is for confirmed contacts with 40 zones and with stickers for 60, 70, 80 and 85 zones. With stickers it is necessary to submit any MM QSL cards to the Awards Manager. WACPR - The award is for confirmed contact with all 90 zones. It is necessary to submit the QSL cards from all the 15 MM Zones to the Awards Manager.

### WAC - WORKED ALL CONTINENTS (IARU)

General:

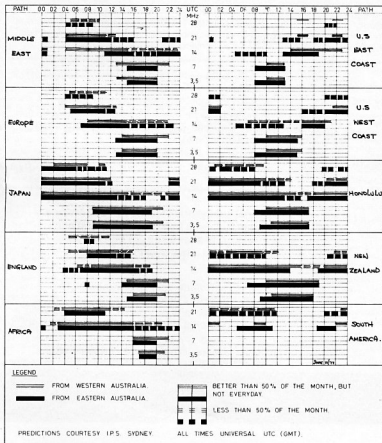
- The award is available to licensed amateurs.
  - Contacts after 1945 are valid.
  - Applicants should send cards to their IARU member society who will then certify the claim to the HQ society (IARU) for issuance of the award. Where such a society exists applicants must be members of the society.
  - Contacts must be made from the same location - the "same location" being taken as an area not exceeding 25 miles (40 km) in diameter.
  - The award is normally issued for CW/phone but endorsements are available for 2 x SSB, all 80 metres or all 160 metres.
  - There is no fee for the award.
- Requirements: One confirmed contact is required from each of the six continents - North America, South America, Europe, Africa, Asia and Oceania.

### BROMSGROVE SILVER JUBILEE AWARD

(These rules have only just been received, but some of you might have qualified.)

Sponsored by Bromsgrove and District Amateur Radio Club to celebrate the Queen's Silver Jubilee 1977. Open to any radio amateur/SWL world wide.

- This award can only be achieved during 0001 GMT 4/6/1977 to 2359 GMT 12/6/77 (to coincide with special GE licences).
- All licence rules to be observed.
- Obtain 25 points any band/any mode/mixed (special endorsement if requested).
- GE3VGG must be worked/hrd. = 1 point  
Bromsgrove members = 2 points  
All other GE stations = 1 point
- GE3VGG-1, G3CLN, G8LJM-4, + 20 x GE.  
Members worth 2 points: G3QV, G3JNY, G3RBL, G4AAL, G4DHH, G6WI, G8IO, G8JTK, G8LJM, G8KLO, G8LXT.
- All QSO direct, no use of any repeater/satellites on any band.
- Check log of QSOs before 31/12/1979.
- Special Certificate will be issued in silver print on confirmation of log by Award Manager G8KLO.
- Cost cheque/PO 50p or 4 x IRCs/\$1.
- Bromsgrove stations will call "QO Silver Jubilee Award" (QO-QO-SBJ).
- Any queries SAE/IRC to G8KLO.
- Award Manager:  
J. K. Harvey G8KLO,  
22 Elm Grove,  
Bromsgrove, B61 0EH, England.





# Deluxe Mobile/Base Station



## FT-101E WITH R.F. PROCESSOR

### ● Solid State 160 thru 10 Meter Transceiver

The world's number one transceiver now offers even more value and performance in one compact, thirty pound package. An effective RF Speech Processor is a built-in integral part of this exciting transceiver. Now you can realize that extra talk power to cut through the pile-ups without the addition of a linear amplifier. Except for the final and driver stages, the FT-101E features the latest in solid state technology, incorporating time proven, plug-in

"computer type" modules for unparalleled reliability and service. New lever type switches offer easier operation. Here is a complete radio station designed to go anywhere—ideal for today's active amateur. Just add an antenna and 12 VDC or 100-234 VAC for instant operation on 160 thru 10 meters. The FT-101E is another step forward in amateur communications from the world's leader in communications equipment YAESU

### Compare these features with any other set in it's class and you'll be surprised at the quality and price.

- \* Built-in AC & DC power supplies
- \* Built-in RF-speech Processor for increased talk power
- \* 260 Watts PEP SSB, 180 Watts CW, & 80 Watts AM.
- \* Factory sealed, solid state VFO for optimum stability and accurate 1 KHz readout
- \* Effective Noise Blanker, threshold adjustable, for elimination of noise spikes
- \* Built-in, fully adjustable VOX
- \* Automatic break-in CW operation with sidetone
- \* Selectable 25 kHz and 100 kHz calibrator
- \*  $\pm 5$  kHz receiver clarifier w/separate ON/OFF switch
- \* Built-in WWV/JJY reception
- \* Heater switch to shut off final tubes for conservation of current drain
- \* Reliable easy to operate lever switches.
- \* Adjustable carrier level for tune-up and novice operation
- \* Built-in speaker

- \* High-Q, permeability tuned, RF stages to provide the performance required even in base station operation.
- \* Includes dynamic, hand-held type microphone
- \* Indicator lights for internal VFO and clarifier operation
- \* Eight pole SSB filter for unparalleled selectivity on today's crowded bands
- \* All mode operation — SSB, CW, & AM
- \* Built-in internal crystal control provision and Dual VFO adaptor

**Optional accessories for the Ft-101E include:—**  
external VFO with four channel crystal control provision. CW filter, 6 and 2m transverters, digital readout adaptor, external speaker.

Bail Electronics also offer a complete service facility, and the plug-in modular construction of the FT-101E allows quick, easy servicing, keeping costs to a minimum.

● Price \$859.00

Above prices include S.T. Freight and Insurance is extra.  
90 day warranty. Prices and specifications subject to change.



**ELECTRONIC  
SERVICES**

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Agents in all States and A.C.T.

FRED BAIL VK3YS  
JIM BAIL VK3ABA



# AMATEUR SATELLITES

Bob Arnold

VK3ZBB

When reading these notes it should be borne in mind that they are written about six weeks before publication, therefore please forgive any omissions or delayed information now and in the future.

I have received an interesting letter from Eddy Roach VK8ZER/NER, who is operating portable VK8 from Giles, which is about the most isolated town in the country. Eddy is looking for contacts via Oscar 7 on both modes A and B; so far, we have not heard him in VK3 but expect to do so before long.

After hoping and trying for about twelve months, contact has at last been made on mode B with Stewart ZK1AA in Raratonga. QSOs with Stewart should be possible from the Eastern States during a period of ten days each month when ascending nodes of 165 or lower are in sight.

The period August/September has seen considerable activity in mode B with new stations appearing regularly. The following newcomers have been heard: ZL1BIV, WJ, VK6ZGQ; VK7JG; VK5SV, ZAU; VK3ADR; ZK1AA.

Notable contacts during this time: VK5SV — 1E, VK3ZBB — ZK1AA.

Have you heard of the Oscar Award? This award is made for confirmed contacts with Six Australian Call Areas plus Two Countries. QSL cards should be sent to Colin Hurd VK5HI, QTHR who is the award manager. Awards have been made to the following VK stations: VK5HI, VK5QR, VK5ZAD, VK3ZBB.

The qualifying conditions in the northern hemisphere are somewhat different from those for Australia and under these rules a total of 126 certificates have been issued. Thanks to AMSAT for these statistics.

Quite remarkable results have been made by mobile stations operating on mode B. VK5UE and ZL1FI have been driving around their respective countries giving good signals through Oscar 7 despite their simple antenna systems — congratulations to them.

Gremlins interfered with the notes published in September on the Phase 3 spacecraft. The reference to power should read 50W NOT 50 mW as printed — more news on Phase 3 later, but meanwhile here is a summary of the AMSAT Oscar D Spacecraft System which is scheduled to fly early in 1978.

1. Japan AMSAT Association 2m-to-70cm Transponder (JA1CEL, JG1CDM, JA1YDV, JA1JHF, and others) — "Mode J".

- Input frequency passband between 145.90 and 146.00 MHz. User should transmit right-hand circular polarization in Northern Hemisphere, left-hand circular polarization in Southern Hemisphere, 100W EIRP.

- Output frequency passband between 435.10 and 435.20 MHz (linearly polarized mono-pole antenna).

- Power output is 1 to 2 watts.
- Downlink passband is inverted from uplink passband.

- Linear operation — SSB and CW are preferred modes. Do not use FM.

- Morse code telemetry beacon at 435.095 MHz.

2. AMSAT Two-to-Ten Metre Transponder (WA4DGU and W3PK) — "Mode A".

- Input frequency passband between 145.85 and 145.95 MHz. User should transmit left-hand circular polarization in Northern Hemisphere, right-hand circular polarization in Southern Hemisphere, 100W EIRP.

- Output frequency passband between 29.40 and 29.50 MHz.

- Power output is 1 to 2 watts.
- Downlink is not inverted from uplink passband.

- Linear operation — SSB and CW are preferred modes. Do not use FM.

- Morse code telemetry beacon at 29.40 MHz.

3. Morse Code Telemetry System (W5CAY, WA4DGU et al.).

- Six analog input parameters measured.
- Converts each analog value into a two-digit Morse code number or "word".

- A third digit precedes the telemetry value and gives the channel number.
- Morse code rate is 20 words per minute.

4. Telecommand System (W3GEY, W3ALN, W3ASZE, W3HUC, W3ITO, K1RT/WA1JZC).

- Turns the "Mode A" and "Mode J" transponders on and off.
- Initiates deployment of ten-metre dipole antenna.

5. Antennas and Antenna Deployment Module (W3GEY, W3HUC, W3ITO, K1RT, W3ALN).

14.10-28 Volt Power Switching Regulator (JA1TUR, W3HQ).

7. Battery Charge Regulator (DJ4ZC, K1RT/WA1JZC).

8. Instrumentation Switching Regulator (W3JVDH and W3GEY).

9. Magnetic Attitude Stabilization System (left-over from Oscars 5, 6 and 7).

10. Satellite Structure and Module Containers (K6GSJ and others from Pro. Oscar, K1JY/WA1JLD, K1RT/WA1JZC, WA4DGU, W3DFB, Henry Smith W3H50 and W3GGIM).

11. Satellite Interfacing and RF Cabling (Marie Lear and Others).

12. Engineering Drafting (W64GIB).

## AMSAT-OSCAR-D ORBITAL PARAMETERS

(Prograde orbit)

Apogee: 577.38 statute miles.

Perigee: 548.665 statute miles.

Period: 103 minutes.

Inclin.: 99.00 degrees.

Time of Descending Node: 9.30 a.m. +30 mins. — 0 mins.

## IARU NEWS

### WARC 79

The following general information which appeared in the September issue of IARU Region 1 News is worthy of reproduction here for general interest.

### CEPT

"During the preparations for WARC 1979 a great deal has been said and written concerning the role of CEPT. For the few who may be unfamiliar with this organisation, the initials stand for Conference Européenne de Postes et Télégraphes. This is a permanent body comprising the representatives of 26 European nations, formed into a number of committees and working groups, with the intention of formulating common policies on matters of mutual concern and interest. The working groups meet at regular intervals with the plenary meetings every 2-3 years.

The composition of the working groups is solely of the representatives of the 26 member nations. Commercial organisations do not directly participate in the work of the CEPT as they may in the studies of the ITU organisations, the CCIR and CCITT. There is no place in the working groups for representatives of any particular service, e.g. broadcasting, maritime, amateur etc. The views of the different services are expressed by the delegates from the national administrations.

Therefore the only way that national societies can influence CEPT is by consultation with their own national administration. If the administration accepts the view of the society it may then take the matters raised to a meeting of the CEPT.

What influence will CEPT have on WARC 1979? First, remember that the voting strength of the ITU now stands at 153. The CEPT has 26 members. These figures speak for themselves. Also, not all members of CEPT will necessarily agree on a common policy that will cause them to vote in a similar way at an ITU conference. It has been noted at previous ITU conferences that differing views were expressed by the Scandinavian nations by the Francophon group and by the UK. In this case the maximum number of 26 votes would be split at least three ways.

This does not mean that CEPT is unimportant. It should be the duty of every national society whose administration is a member of CEPT to take the views of the amateur service to their administration and thus into the meetings of the CEPT.

How many national societies have done this? According to reports reaching the Region 1 secretariat, only a very small number. WHY?

The IARU can advise and assist when requested but it does not have the power to talk with national administrations (unless asked). This is the duty of each national society. It is most strongly urged that this work, if not already commenced, should begin immediately before it is too late.

There are other organisations similar to CEPT, that exist in Eastern Europe and Africa, e.g. DIET and PANAFEL. The same comments apply to liaison with these groups.

The IARU exists to combine, assist and advise. If your national society is of the opinion that we can help in any way please let us know without delay. Also — and most important — please let Region 1 the results of your contacts with your administration. We sometimes need to remember that the amateur service consists of communicators.

From the same source comes the news of a meeting of IARU R1 members and non-members in Johannesburg for 3-4th December to talk mainly about WARC 79. At least 32 African countries are members of the ITU but have no amateur radio societies.

Another short article from this journal would interest visitors to Europe —

### 4U1ITU

"This very well known station is located on the 12th floor of the headquarters building of the International Telecommunication Union in Geneva, Switzerland. The International Amateur Radio Club, which is responsible for 4U1ITU, is supported by the IARU, who recognise the high value of an office of the IARC having the valuable services of world telecommunications. The Secretary-General of the ITU, Monsieur M. Mill, is a Patron of the IARC.

There are many visitors to 4U1ITU and to keep the equipment in an operational condition is a difficult and lengthy task. During the past few months the IARC has had the valuable services of David Kaplan, CX3AAQ, who has offered to give a great deal of his time to maintaining 4U1ITU. David is a professional engineer and his help has been invaluable.

QSLs for the station are once again being handled by Gerard de Buren H8SAW, who devotes a great deal of time to this work.

The members of the IARC are all working persons and often it is very inconvenient to receive casual visitors. If you have the intention to visit 4U1ITU it would be appreciated if you would give notice of your forthcoming visit to the President of the Club, Ted Robinson, FB9U, IARC, Box 5, Place des Nations, 1211 Geneva 20, Switzerland."

NZART has filed its formal submission to the New Zealand Post Office in relation to WARC 79. The frequencies requested are those set out in the IARU position paper.

IARU recognises the importance of microwaves to the amateur service and reports several new records. DL70Y is reported as having designed new 3W CW/SSB 10 GHz equipment and others in Europe have designed simple gear for the same band. Is anyone interested? The REF (France) is sponsoring interest in 10 metres under the "use it or lose it" slogan.

## BOOK REVIEW

"Solid State Design for the Radio Amateur" by Hayward and DeMaw. 256 pages. Published by ARRL, 1977. \$9.00 (US). Our copy courtesy of the publishers.

Seldom has a technical publication so excited the reviewer's enthusiasm as this. Readers of OST will have noticed over the past ten years or so that the name of Wes Hayward (W7OH) has

often appeared on articles of interest to the "home-brewer". Now he has, in partnership with Doug DeMaw (W1FB), the Technical Editor of QST, produced a textbook of outstanding value to all those interested in solid-state communication equipment. It reflects throughout the professional competence of both authors. In particular W7ZO1 is an engineer with Tektronix, and freely acknowledges a great deal of assistance from that well-known company and other members of its Communications Division.

The book deals, in nine chapters, with most significant aspects of transmitter and receiver design, plus test equipment, modulation methods, and field operation. Emphasis is mainly on applications in the HF bands, but VHF is not entirely neglected. There are five appendices on topics such as filter design, phasing—method SSB, and toroidal-core data. There is also an excellent bibliography of 2½ pages of references to the amateur and professional literature.

Actual items of equipment are described throughout in sufficient detail to enable the competent experimenter to duplicate them, in performance if not appearance. But the purpose of the book is not primarily to describe equipment. Rather, it is to discuss the principles involved in achieving a desired performance level, and to show by example how the design requirements (often mutually conflicting!) may successfully be reconciled. It achieves the aim better, in this reviewer's opinion, than any other single book yet published. Only the most diehard "appliance-operator" could find it other than indispensable.

VK3ABP

"Newsies Colour TV Servicing Manual" by Gordon J. King, Volume 3, 233 pages. Published by Butterworths, 1977. \$18.00. Our copy courtesy of the publishers.

In as much as it refers entirely to colour TV receivers for operation on the 625 line PAL system, this book will be of interest to amateur television experimenters as well as service technicians. Some of the material presented is sufficiently general to be applicable to receivers used in Australia.

However, the greater part of the book consists of detailed descriptions, with qualitative functional theory, of specific makes and models available on the English market. As such, it is not entirely relevant to our local scene. Particularly at the "nuts and bolts" level of control and test-point locations or circuit-board layout and connections it would be of little use to the Australian technician.

VK3ABP

## MAGAZINE INDEX

Syd Clark, VK3ASC

### BREAK-IN July 1977

Reception of Double Sideband Suppressed Carrier Transmission; The "Galbraith" Keyer Paddle GK1; Extending the Gating Time of the "Galbraith" Counter/Timer; Kenwood TS-520 Enhancement for CW Operation; A Short History of Channel D Meters; thorough or How to Set Up a Repeater in Several Hard Steps; Problem Problems in Radio Communication.

### HAM RADIO May 1977

New Multiband Longwire Antenna Design; The Ground Screen; New Coaxial Balun; Antenna Transmission-Line Analysis; 10-GHz Broadband Antenna; Automatic Control of the Ham-M Rotator; Fine Tuning The Phased Array; Mobile VHF Antenna Comparison; High Performance 80 Metre Antenna; Using the Slotted Line; Remote Switching of Antennas; Raising Masts with a Gin Pole; Designing a Phased Array with a Hand Held Calculator; All Band Bob-Tail Curtain.

### QST June 1977

FM Repeater Audio—Good or Bad; Testing Grade-Out Integrated Circuits; Learning to work with Integrated Circuits; A High-Performance Low Frequency Converter; Build This Solid State Titan, Part I; Design Your Own Active Audio Filters; Weak Signal Reception on 160 — Some Antenna Notes; What Does My S-Meter Tell Me; Phase III: Toward the Ultimate Amateur Satellite; Educators Learn About OSCAR and Amateur Radio; See OSCAR and Lots more at the Kennedy Space

Centre; Getting High for the Bi-centennial; The Silent Leaf Assault; Ham It Up on the Broadcast Band; Anderson Answered — Local Hams do the Job; Assessing the CD Appointment Structure, Part 1; First Canadian WARC Proposals List New Ham Bands; Repeater/Remote Re-Regulation; Moved and Seconded; Are You Legal; The JARR Awards Program; The 1976 Bicentennial Relay; Sixteen Years in Iran: The EP28Q Story; Results, Seventh Annual ARRL 160 Metre Contest; Frequency Measuring Test; 1976 VE/W Contest Results.

### RADIO COMMUNICATION August 1977

Observations on the Flyswatter Antenna; After Living with the G8IBR 144 MHz Receiver; CMOS Crystal Controlled Toneburst; Modifying the Yaesu FT231 for 1.6 MHz Shift for UHF Repeater Working; The Dating UC/1 Up-Converter; Propagation Study for Satellite Links at 12 GHz.

### 73 May 1977

Build the World's Simplest Keyer; Stop that Autostat; Predict the Weather; Learn a New Language; The History of Ham Radio; The Oily Resistor Wattmeter; SSTV Slalom Game; Computer-Controlled Thermometer; Computerised RTTY Takeover; Let BASIC Control Your Next Contest; Satellite Zap; VHF Noise Snooper; Understand Your Pat Rock; TTL Techniques; Sending HI; Build a DDR

for Your Mobile; Headphone Jack Adapter; Automatic Taping Unit; Let's Use English; CB to 10 — A Legal Alternative; The Ham Classroom; Save Your Old Speakers; Beware the Compressor; Matching Output Transformers; Stop Time-outs; Have You Tried Television; Quick Vertical; Try Power Saver Logic; HF Bands Expander; Fight Inflation! Build it Yourself; Wilson HT Mods; Try These IC-230 Mods; All Electronic Selfcall.

### 73 April 1977

Shoot the Moon; Frustrating the Thieves; Automatic Autopatch Release; Emergency 911 System; The Downspout Vertical; RTTY That's What; Do-It-Yourself Photosensitising; Making Your Own PC Boards; Curing Mobile Noise Miseries; More on HKITL; An Intelligent RTTY Station; Interrupt Explained; CW for the 6000; The Super Clock; Add Class to Your Mobile; The Final Feeder; What about Surplus NICADs; The History of Ham Radio; Wind Your Own; Discriminator Output for the HR-2A; The Phantom Exposed; Retire to a Ham Heaven; Hamming the Buggy Sweepstakes; Taming the Wild Beta; A Combiner for Your 2m Whip; The Carbon Marvel; Minicom Receiver; Those Illegal CB Channels; Leading Zero Suppression; An FM Gadget; The Real Truth about SWR; Improving the Dipole; The 60 w.p.m. Conversion; Digital Autopatch; Harness the Wind.

## AFTERTHOUGHTS

Page 8, centre column, 4th para. line should read: "at a certain distance from the camera, cor—" ■

### LOW COST VIDICON AMPLIFIER (AR September 1977) ERRATA

Page 6, centre column, 2nd para. line 8 should read: "(FET input), and also facilities for line—"

Page 6, RH column, 1st para. line 6 should read: "slope of 6 dB/octave or 20 dB/decade."

Page 6, RH column, 2nd para. line 2 should read: "low value load resistor will produce a low"

Page 7, LH column, 3rd para. line 3 should read: "gain of 4.7. Adjustable low frequency"

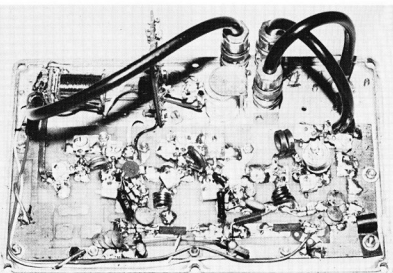
Page 7, RH column, 3rd para. line 20 should read: "across the +12V and earth rails at various"

Page 7, Circuit diagram. The bias divider chain for Q1 should have a 100 nF Hi-K ceramic capacitor across the 100 uF 16V bypass.

### PLEASE NOTE: WANTED.

S.S.T.V. contacts. All mode, from 52 MHz to 432 MHz. Please contact VK2ZXL C/O Sideband Electronic Sales 521-7573 (02)

A view of the "works" of Ian VK3ALZ's 2 metre 20W linear. See AR October 1977 page 18. — Photo by VK3AFV.



# WHAT'S BLACK & WHITE AND TURNS 2-METRE OPERATORS GREEN?



## THE NEW KENWOOD TR-7400

This is the one, the Kenwood TR-7400 FM mobile transceiver of 25/10 watts and complete 2 metre band coverage (144-148 MHz). It has the largest digital readout in its class, and the 800 channel

coverage with PLL frequency synthesizer provides you with all existing and proposed Australian repeaters. A convenient front panel switch offsets the transmit frequency up or down 600 kHz.

### WHENEVER YOU WANT TO MOVE UP — KENWOOD HAS THE WAY



TR-2200 2-metre VHF  
FM portable receiver



R-300 all band or ham  
band communications  
receiver



The new  
TS-520S HF transceiver  
— ideal for the novice



TS-700 2-metre VHF all  
mode transceiver

Your nearest Kenwood dealer will be happy to give you more information on the entire Kenwood range of amateur radio products including the remarkable new TR-7400. Contact him direct or write to us at Weston Electronics.

Marketed in Australia by  
Weston Electronics Company,  
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Distributor for Trio Kenwood  
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WEC AP 2

# VHF-UHF AN EXPANDING WORLD

Eric Jamieson, VK5LP

Farmon, 5233

## AMATEUR BAND BEACONS

VK0	VK0MA, Mawson	53.100
VK1	VK1RTA, Canberra	144.475
VK2	VK2WI, Sydney	52.450
	VK2WJ, Sydney	144.010
	VK2RHR, Millington	144.120
VK3	VK3RTG, Vermont	144.700
VK4	VK4RTT, Mt. Mowbray	144.400
	VK4RBB, Brisbane	432.400
VK5	VK5VF, Mt. Lofy	53.000
	VK5VF, Mt. Lofy	144.800
VK6	VK6RTV, Perth	52.300
	VK6RTU, Kalgoorlie	144.500
	VK6RTW, Albany	52.950
	VK6RTU, Albany	144.500
	VK6RTV, Perth	145.000
VK7	VK7RNT, Launceston	52.400
	VK7RTX, Launceston	144.900
	VK7RTV, Launceston	432.475
VK8	VK8D, Darwin	52.200
KG6	KG6JQJ, Guam	50.110
KH6	KH6EQI, Hawaii	50.104
ZL1	ZL1VHF, Auckland	145.100
	ZL1VHF, Waikato	145.150
ZL2	ZL2MHF, Upper Hutt	28.170
	ZL2VHF, Manawatu	52.500
	ZL2VHF, Wellington	145.200
ZL3	ZL3VHF, Christchurch	145.300
ZL4	ZL4VHF, Dunedin	145.400

Graham VK8ZCJ writes from Darwin advising the beacon VK8VF is now operating 100 per cent. He goes on with news of happenings in that area, firstly on the metre scene with openings to Japan as follows:

30/7 0811 to 0850Z JA1 and JA9, six stations.  
11/8 1002 to 1030Z JA1TTS.  
8/9 1148 to 1240Z JA1, JA2 and JA6, five stations.  
9/9 1250Z JA6UWK.  
10/9 1038 to 1219Z JA1, JA2 and JA3, 15 stations.  
11/9 0710 to 0755Z JA1, JA2, JA3 and JA4, 16 stations.

"A couple of interesting things to note were that Tei JA1TTS worked into W5 on 12/7/77 and claimed this to be via sporadic E. This being so, five hops would be involved. For me to work V56, JA and ZL it takes three hops and that is quite rare. (It's really to V56BE there by Es.) So five hops Es is really something! Tei advised me this year he has worked KG6, KL7, J01, VK, DU, V56 and W6, which is really great.

"KC6PO was operational last week from the Caroline Islands. The OXpedition was worked in JA on 19/1/77, nothing heard in Darwin.

"On 11/9 I was working JA6ZV with the copying WB5BJ/DU6 and I ran a test with the station in DU6 at the request of Yoshi. Nothing heard. Yoshi played back a tape of the station. We were all on 52.040 at the time.

"Also on 11/9 JRI4UW asked for a test on two metres. We arranged it for 1200Z but nothing heard. Six metres was not open at that time although for the three previous evenings it had been. Frequency was 144.100 MHz. There appears to be quite a bit of interest in JA about working VK on 144.

"Finally, 'Flash' VK6FN in Derby is now on 2 metres with about 100 watts to a 16 element yagi." Thanks for the news, Graham, it's good to hear someone is keeping interest alive on six metres from VK for the benefit of overseas countries. I'm sure he'll be happy it would be if you could operate on 50 MHz.

I was also pleased to receive a letter from Fred VK2BFJ, who lives in Killarney Vale, and who previously held the call of G3WS. For some years before coming to Australia Fred was very active on 2 metres in the UK, working a total of 14 countries in Europe in the years 1952 to 1959. Since moving to VK land he has confined himself mainly to HF operation.

However, as with all good VHF oriented amateurs he felt something lacking, and has

decided to start operating on 2 metres again. A TS702A now has a good position at the operating table, and outside a 5/8 wavelength vertical for local contacts and a 10 element yagi for the DX contacts, and will look at the need for a 100 watt linear if the need arises.

We welcome you to the band, Fred, and hope you will have some enjoyable contacts, although operating is somewhat different here from the UK in that we have no close countries to work, even New Zealand is a rather elusive 2 metre contact. Good luck and always pleased to hear from you.

## SIX METRES

It looks as though my thoughts on trying to regain all or portion of the 50 to 54 MHz band has not fallen on deaf ears or blind eyes. This month I have received some very interesting mail from readers, each one contributing their thoughts on the proposals outlined in the September issue of AR. There have been some extremely good suggestions made, and all will be carefully noted on the day of reckoning.

I am pleased to acknowledge correspondence on the matter from the following: Ron VK2ATQ, Geoff VK3AMK, Stephen VK3VEZ, Peter VK3ZYQ, Keith VK4KX, Keith VK4AKT, Allan VK4ZBB, Reg VK4RRM, Joe VK7JG and Graham VK8ZCJ. In addition, both VK4KX and Allan VK4ZBB have supported the proposals in discussions on the air. That makes ten letters so far, I would hope to receive at least another 100 in the next month or so. Why not write now and give me your views on the proposals? There have been a few side issues come to light in the present letters and points worth noting. At this stage I see no need to mention them as I would like to have the spontaneous presentation of your thoughts on the pros and cons of the matter without feeding you information.

I said before, and I'll say it again, if I take up something which I believe worthwhile, I will leave no stones unturned in an effort to get somewhere, but I do need the support of the VHF fraternity. Last year I worked more than 100 different stations on six metres alone, and I would expect to get some correspondence from all of you. I want your thoughts in writing, not only on the air, but certainly discuss it on the air, then write. And this applies equally to VK5 operators too, stop being lazy and half-hearted, just because I live in VK5 doesn't give you any more privileges, or to rest on your laurels, whatever you rest upon! Get cracking you locals, too.

## GENERAL NEWS

From amongst the many pages of correspondence received on the matter of the 6 metre band allocation some have included various items of general interest, and the following has been selected from those pages, with acknowledgements as shown.

Ron VK2ATQ supports the suggestion re a memorial to Ron Wilkinson VK3AKC to be in the form of a trophy awarded each year to the operator who has made the outstanding contribution to VHF-UHF. What do the rest of you think?

Peter VK3ZYQ remarks he had a great time on 6 metres last year, despite Channel 0, and worked VK2, 3, 4, 5, 6, 8 and P29 using 250 mW PEP output to a 4 element yagi. Great difficulty getting through at times when strong stations are around, but great fun! That's a fine spirit, Peter.

Joe VK7JG mentions in Tasmania they have a translator operating on Channel 0, which covers a limited service area and presents very little problem.

Keith VK4KX writes: "An incentive to work ZS on six metres with today's 'super-gear'. I heard Z51ET on MCW on 50.02 approximately on Tuesday, 10/9/77, 1845, on a 12E EAST R7 on peaks, with some QSB. It was apparently a beacon station identifying every 20 seconds. VK3, 5 and 6 were also in at the time. Weather patterns similar to present season. Rx—522 (original) to 4 element yagi, 20 feet high." That's a bit of rather interesting reception Keith, I wonder if anyone else heard the station?

Geoff VK3AMK advises having received a report of W6ZG being anxious to work VK stations on 6 metres, and has been hearing signals on Channel 0 frequency.

## MOONBOUNCE REPORT

From "The Propagator" Lyle VK2ALU reports that repairs were made to the dish surface and the main part of the Clavin feed was made up and installed. Initial tests showed a small improvement in gain, but the required impedance matching arrangements has yet to be installed to give the lowest SWR.

An EME test on 2/9/77 was scheduled with SMSBPK who was not heard, and FT2U who was contacted with "M" report both ways.

Further damage has been caused to the moonbounce site buildings by vandals but essential equipment has not been damaged.

## VHF/UHF FIELD DAY

Note the New Zealanders are going ahead with their annual Field Day on Saturday, 3/12, and Sunday, 4/12, and will be operating on Saturday night a/d Sunday morning local time.

The VK5s have tried to hold a Field Day Contest on the first week-end in December for several years with not a lot of success, especially when it comes to having logs returned. However, there does not seem to be any need to drop the idea entirely, so what about the following suggestions being followed this year for a round Australia VHF Field Day?

1. Base the operation upon the rules and regulations for the 1974/75 Ross Hull Contest, including scoring on the distance scale.

2. Cross band contacts permitted with points being claimed for those applicable to the higher frequency band of the contact concerned.

3. Contacts with the same stations permitted at not less than two hourly intervals for band to band or cross band contacts as the case may be.

4. Field Day stations to be powered from a source other than AC mains. Operation from a vehicle permitted provided it is stationary. Contacts through repeaters not to be included in scoring.

5. Base stations are invited to work field day stations and to exchange numbers in the usual way.

6. Fill out your log book in the usual way, showing the contest numbers exchanged, add in the points score and approximate mileage, then take your sheets photo-copied. This will save the need for hand copying on to contest pages. Most people have access to a photo-copier in their area.

7. Include the usual front sheet as per Ross Hull rules, and forward to VK5LP by the end of January 1978. There will be a trophy for the winning entrant.

8. The aim of the field day is to assess whether there is enough overall interest to have a try at making it an annual event. By using the Ross Hull rules for 1974/75, which were published in the AR, instead of the current rules there is some incentive to take out equipment for more than one band.

The cross band operation helps you to keep active during the day, and keeps you on your toes. Try it!

9. Operating hours to be from 0730Z on Saturday, 3/12/77, to 0730Z on Sunday, 4/12/77, for the six hour section, and for those unable to operate for 24 hours any two three hour continuous periods, e.g. from 0800 to 1100Z on 3/12 and 1900 to 2200Z. This makes a total of six hours. You may also operate for any one period of six continuous hours for the six hour section.

10. These are a set of hastily drawn up rules anyway. If you are not sure about any points use your own sensible judgement and interpretation of what you believe would have been required. Even if you cannot go out to a field day should you not come on and give those who do some contacts? With the possibility of some stations at good sites in different areas of Australia it might be surprising how far contacts can be made, particularly on 2 metres, and it will be the right time for the year for this too.

That's about all for this month, there have been a bit slack on the air, and I have been rather busy, so probably have missed a few things. Concluding with the thought for the month: "Most ignorance is vicinable ignorance. We don't know because we don't want to know."

73. The Voice in the Hills.

# AROUND THE TRADE

## LOW COST SURVEILLANCE RECEIVER

The Watkins-Johnson Company, who specialise in defence communications equipment, has now produced a modestly priced general purpose HF receiver which is ideal for surveillance work.

Identified as the Model WJ-8718, it is designed to be used in either a manual mode or with remote digital frequency control. It is capable of detecting AM, FM, CW, ISB, LSB and USB transmissions (A1, A2, A3a, A3b, A3c, A4, F1, F2, F3 and F4) over the frequency range.

Using the building block approach, certain features are available as options to increase the capabilities of the receiver. The mainframe provides the following:

- 5 kHz to 30 MHz Frequency Coverage.
- Seven Selectable IF Bandwidths from .3 to 16 kHz (including the ISB option).
- Seven-digit Green LED Frequency Display.
- AM, FM, and CW Detection Modes.
- Low Phase Noise Frequency Synthesizers.
- 10 Hz Tuning Steps.
- Tunable Synthesized BFO ( $\pm 8$  kHz).
- Audio Level/Signal Strength Meter.

Options include the following:

- Remote Control Module (RCM).
- Manual Control Module (MCM).
- ISB Module (ISB).
- Sub-Octave Prescaler Module (PRE).
- 10 Hz BFO Synthesizer Resolution (B10).

Tuning range of the WJ-8718 is 5 kHz to 29.99999 MHz with a tuning resolution of 10 Hz. Frequency display is by 7 digit green LEDs.

Full technical specifications are available from R. H. Cunningham Pty. Ltd., phone (03) 329 9633. ■

## SENNHEISER INFRA-RED SOUND

Sennheiser Electronic of Hanover, West Germany, and its partner in Australia for over twenty years, R. H. Cunningham Pty. Ltd., announces the introduction into Australia of Infra-Red sound. It will be known commercially as SENNEISER INFRA-PORT. It is claimed to be the only major innovation in high fidelity sound since the introduction of the "compact cassette" some thirteen years ago.



The major attraction to the SENNEISER INFRA-PORT system is that an audio signal may be recorded through headphones without any cables, wires or leads to get in the way or obstruct any movement. Models are available in both monophonic and stereophonic versions. ■

## DICK SMITH RETAIL STORE OPENS

### AT PARRAMATTA

Dick Smith Electronics opened their sixth store at Parramatta on August 1st, 1977.

The new store, situated in Perkins House, 30 Grose Street, is the sixth in a growing chain of "Electronics for the Enthusiast Stores" — Grose Street runs parallel with Victoria Road, north of Parramatta.

The first store at Gore Hill opened nine years ago and since that date, Dick has opened stores in the City (York Street, Sydney), Bankstown, N.S.W., Brisbane and Melbourne. The Manager of Parramatta is Bill Edge who formerly managed his own electronics business in Sydney, called Edge Electrix.

Dick expects the Parramatta store to grow with the Parramatta area, which is a major shopping centre. ■

# LARA

## Ladies Amateur Radio Association

In this month's article we have news of YLs from all over the place.

Susan VK2BSB, after an absence of some years, is suddenly bursting with enthusiasm for amateur radio. She has started a new radio club, the Liverpool and Districts Radio Club. No doubt she will be pleased to hear from any interested amateurs living near Liverpool.

Two New Zealand YLs have joined the DX-pedition to the Permadeck Island Group near Auckland. They are Marilyn Lister ZL1BKL and Carol Johnston ZL1AJL. They are at Raoul Island, which is the largest of the group and the only populated one. The population of ten operates the

meteorological station on the island. The whole island group is a flora and fauna reserve and the DX-pedition party had to obtain special permission from the New Zealand Government.

Speaking of New Zealand, Mavis VK3KS won 8th place in the recent WARO competition. She was the only DX YL to compete, and special mention was made of this fact. Unfortunately she was referred to as VK3KB.

Lorraine, wife of VK6BV, should by now be admiring the new quad in the back yard. The last one was destroyed during the Kalgoorlie earthquake.

One of the newest licensed YLs in New South Wales is Elizabeth VK2XIB. Elizabeth also holds a commercial operator's licence.

One of the latest Victorian licensees is our very own publicity officer, Heather VK3MVF. Heather is working steadily towards the full call.

In the 1977 Call Book 32 licensed YLs and 25 YL shortwave listeners are listed.

In next month's AR we will be starting a series on semi-famous Australian licensed YLs. 33's from LARA.

Heather Mitchell 3NFY, Publicity Officer. ■

# QSP

## QRP

An article by K8EEG in June '77 CQ mentions the "almost impossible" challenge of working 100 countries with less than 5 watts output. It had not been done before but now five stations have qualified. The harder DXCC Milliwatt Award (1 watt power output) has not yet been achieved, says the article.

# HAMADS

- Eight lines free to all WIA members. \$9 per 3 cm for non-members.
- Copy in typescript please or in block letters to P.O. Box 150, Tororik, VIC 3142.
- Commercial advertising is excluded. Repeats may be charged at full rates.
- Closing date: 1st day of the month preceding publication. Cancellations received after about 12th of the month cannot be processed.
- QTHR means the advertiser's name and address are correct in the current WIA Radio Amateurs Call Book (note for October AR only — because of delays in processing, the 1975 Call Book refers).

## FOR SALE

**DC-200 Yaesu Mobile Power Supply for FT220**, complete with plugs and cable, very good condition, \$60. Mark mobile helical whip, 158-40, HW-40, HW-20, \$15 each. VK3EJK, QTHR. Ph. (03) 45 1861.

**Toroidal Cores again available.** Build that balun or antenna coupling unit now. Cores similar to p. 581 of 1977 ARH Handbook. Handle legal power 3-30 MHz, \$7.55 ea., plus postage. VK3AGF, QTHR. Ph. (03) 379 6524.

**Yaesu FTDX 431 10/80m**, matching speaker, mic, cooling fan, excellent CW filter and effective noise blanker. Instruction manual. Price \$400. Also Multi 7 2m, excellent performer, 13 sets of crystals, \$170. VK2AAC, QTHR. Ph. (02) 521 7080.

**Ideal DX location at foot of Mt. William.** Using of country church intended for conversion to weekend, easy access to Gramplains, Ararat and Great Western, 200 km Melbourne, partly furnished, electric stove and refrig, electricity and water. Owner transferred interstate, \$6,000. VK3OB, QTHR. Ph. (03) 560 2804.

**Swan 350 Transceiver** with AC power supply, good condition, \$350. VK4WB, QTHR.

**Greller Australian Encyclopedia** (9 volumes plus 1 index), never used, gift duplicated, \$50. VK2AM, QTHR. Ph. (03) 49 6636.

**Atlas AC Power Console** for Atlas 210X, etc. In excellent condition also complete set of ASAHV AS303A mobile centre loaded whips for 80 to 10m. VK4XT, QTHR, or write to Box 498, Dalby, Ph. (074) 62 2389.

**Lafayette Ha-600A** all band RX, excellent condition, 2 speakers, headphones, complete with manual and battery cable, \$150 or ONO. A. Harrison, Nilma. Ph. (056) 23 2450.

**Kyokuto FM114-10LA** 12 channel 2m FM Transceiver, complete with commercial 5/8 whip, \$120 or ONO. VK2BML, QTHR. Ph. (02) 48 1263.

**Ken KP202 C/W** ch. 2, 4, 6, 8, Simplex 40 and 50, nicads, and Ken charger, original condition, \$145. Siewa 25/2 watt C/W ch. 2, 4, 6, 8, Simplex 40, 50, 51, excellent condition, \$160. Will exchange for good general coverage comm. Rx. Ray Price VK3AWQ. Ph. (056) 74 1351.

**Brand new Atlas 210X** solid state SSB Transceiver with noise blanker, Atlas 240V deluxe AC console speaker, Atlas deluxe mobile mount, Atlas 10X 10 ch. stat. oscillator, Shure 404C mic, mark 'x' helical mobile antennas for 80, 40, 20m, with mobile base; all equipment brand new in factory sealed cartons, \$1,250; a/s/o brand new Wilson WE-800 2m FM portable synthesized radio, switchable 1 and 12W output, complete with nicad batteries, frequency range 144-148 MHz in 5 kHz steps, five pre-set channels, \$399. James Goodger VK2JO, Ph. (056) 36 2981.

**Novice Pand 10m Transceiver**, converted SBE sideband, 23 ch. CB, new: nominal PEP out, 20W, \$235. VK3BDM, QTHR. Ph. (03) 48 4063 A.H. (03) 48 5190 Bus.

**Field Strength Meter** for ham or CB use, \$5; Joystick antenna, 1.50 to 30 MHz C/W type 5 and 3 type 3 ATUs, \$25; Woden UM1 modulation transformer, \$8; HF and VHF tubes, all new or as new, COV05-20 or 20A, \$10 ea.; COV05-40, \$12; OV04-7, \$3 ea.; 2E26, \$4; 5763, \$3 ea.; 5B/254m, \$5 ea. or 99 pair; EC81 at \$3 ea.; EF95 EF91/277 at \$2 ea.; power transistors, types 2N1490 and 2N1514, ideal for high current LV regulated power supplies, \$5 ea.; Eddy's one split stator variable capacitors VHF type 563, either 15 x 15 pF or 25 x 25 pF, \$3 ea.; Collaro high fidelity crystal microphone, hand type, \$10; fundamental freq. BTG type xtals, all new, in following frequencies 7027, 7066, 7083 kHz, \$5 ea.; harmonic frequency types, also new, 10033, 117550, 14080, 15030, 21777, 32500 and 14033, \$4 ea. VK2BGF, QTHR. Ph. (043) 32 5758 any time.

**Teletypewriter Model 15**, brand new, complete, \$70. VK3ZY, QTHR. Ph. (02) 277 4748 A.H., 630 5081 Bus.

**FT200** with full 10m crystals, power supply, speaker and mic. \$295; TS200, used only Jan. to Dec. 1977, \$299. VK2BML, QTHR. Ph. (03) 721 1657 A.H.

**Yaesu FT101** 160-10m, plus SP101 and misc.; Yaesu FT1200 linear; Heathkit HQ10 monitor scope; Trio 9R90S com. Hx 550-30 MHz; Trio mic. MF50 plus stand valves 5728 6J5S; mobile helical antenna and mount. Must sell all gear; best offers. VK2BSP, 7 Amaro Ave., Wahroonga. Ph. (02) 48 6624.

**Galaxy III**, 80-40-20m Transceiver, 440W input, with matching AC power supply/spkr. and A/C power supply, with manual, new spare 80m tubes and mobile mount, \$350. VK6ED, QTHR. Ph. (097) 52 1173.

**VHF Gear:** FTV-650 6m transverter, "FTV-250" 2m transverter, switching box providing for mono/crossband operation with up to 4 transverters plus HF, 3 spare FTV-650 cases and meters, misc. Yaesu parts, \$350 the set. FM 2m mobile, Inoue IC30 with 4 current xtls, \$115. Oscar array comprising 2 el. 29 MHz yagi, 11 el. 146 MHz LPA, masts, AR22R rotator, control unit and control cables, 100. Bob VK3AOT. QTHR. Ph. (03) 697 6612 (bus.), (03) 787 6426 (AH).

**FT200** Transceiver with power supply, handbook and complete set spare valves, \$350. VK2ABR, QTHR. Ph. (03) 520 0866.

**Lafayette PI08A VHF** Rx Tuner 144-174 MHz FM, plus 2 xtl. channels, includes inbuilt A/C power supply, speaker, variable graphic, CW, 100m cables and hardware. As new in box, \$75. Ph. (03) 487 2131 bus., or (03) 460 7973 (AH).

**Collins 500** kHz Mech. Filters, 1 set, B/Ws 800 Hz, 3-1 kHz and 6.0 kHz, sell \$30 or swap for 8 MHz SSB filter plus 1 or 2 carrier xtls; also 1 Collins 455 kHz mech. filter for CW, \$15. VK2YDY, QTHR. Ph. (067) 52 1185.

**Steel Tower**, 86 ft. free standing, 4 sections, fitted with heavy duty prop-puller rotator and indicator with TIMEX 1000 Hz. battery, Ultimate DX antenna, transported and erected, \$450 ONO. VK3BAJ, Ph. (03) 874 5554 bus.

**KW Viceroy Mark IIIa Tx** 10-80m, \$375; Hallcrafters SX117 Rx Triple Conv. xtl. calib. xtls for 160m (160 conv.) 80-40-20-15-10m. Up to 29 MHz 10 MHz WAVY and provision for 5 further 500 kHz segments in range 75 kHz to 30 MHz, \$300; SB200 10-80m linear amp. 2x5728 in final, \$400; DX100 Tx 150-10m CW rig, includes hefty (2 kW) 117 2A tranny, 70. VK6HD, QTHR.

**Rotators** Ham II, \$125; Alliance U100, 115 volt, ideal VHF or small HF ant., \$35; Marconi HF sig. gen. 20 kHz-30 MHz, \$175; IC22 crystals, rpt. 1, 3, 4, 5, 6 and 7, simplex 50, \$11 and 147.63, \$7 per set; Yaesu YD844 deluxe desk mic, \$30. VK3OM, QTHR. Ph. (03) 960 9215.

**Power Supply** 230V 40/60 Hz Input, 325V at 30/30 mA DC out, assembled on rugged chassis, primary and secondary fused, mains xfrm. oil filled, size of PS is 12 in. x 7 in. x 6 1/2 in., no case, \$25; Woden UMI modulation xfrm., 10; low voltage bench power supply 6 to 15V DC adjustable output at 50 mA, S/C protected, \$15; VHF tubes QV05-20A, \$10 each; QV05-40, \$12; QV06-20 (40), \$5; QV04-7, \$3; M/C meters 2 1/2 in. sq. face 0-20 mA (FSO) made by E. Turner (UK), \$10 ea. Please add little extra for postage or freight. Ph. (043) 32 5758 any time.

**Central Electronics Signal Slicer** (SSB adaptor) Model "B" with built-in "Q" multiplier — 115V AC — \$50; Johnson Courier Linear, pair 811As, 115V AC — \$95. VK3LS, QTHR. Ph. (03) 82 2152.

**Atlas 215X Solid State HF SSB Transceiver**, brand new, with noise blanker, mic. and comprehensive lab. work and handbook, complete to performance 160-15m, superb receiver, ideal mobile rig, price: \$750, is approx. \$200 off local new price. Vic. VK3AVP. Ph. (03) 231 2452.

**Citizen Dual Time L.C.D. Chronograph Watch** with stop watch facility, brand new with guarantee, gold, spare battery, accuracy within 5 secs per day, mobile rig and handbag, suitable for performance time zone. Price: \$150 ONO. Vic. VK3AVP. Ph. (03) 231 2452.

**Brand new New-Tronics Hustler 4-BTV vertical** trap antenna giving 10-40 mhz coverage. Never used as minibeam to take its place. Separate settings for phone and CW not necessary. Radio-efficiency greater than other traps. Performance \$100 ONO. Ken VK6ZA, Box 768, Carnarvon 6701. Ph. (099) 41 1001.

## OBITUARY

**LINDSAY H. (TUBBY) VALE VK5NO**  
With the sudden death of "Tubby" Vale, VK5NO on October 1st, 1977, Australia and the world lost one of its foremost Amateurs and Contest Operators.

First licensed in the early 30s as VK3MK, Tubby worked with Electronics the whole of his life, as well as making it his hobby. Many of today's amateurs can look back to the help and encouragement given them by SNO when studying for their ACP. Right up to the time of his death he conducted slow code practice sessions for beginners.

His quest for further knowledge took him to various parts of Australia and England, with short periods in both France and Belgium and as well as the two call-signs previously mentioned he also operated VK2ALU, 2ANN, 8NO and a G call.

Although lacking in academic qualifications, Tubby was able, by sheer knowledge and ability to push his way through in his sphere. He relinquished his job as Chief Electronics Engineer with Dr. Haviland (Australia) to take up the position as Manager of the ELDO Satellite Tracking Station at Gove in the Northern Territory. It was while he was there that the heart condition that led to his death, first manifested itself.

Everyone who worked an RD Contest will remember the outstanding scores made by SNO. This was despite the fact that he never used a transceiver, always repaired pieces of equipment which he made himself. Only a few months ago he obtained the wherewithal to transceive. The first and only time he ever bought any ready made gear — and was looking forward to using it in the CW Section of the VK-ZL Contest this year. It was in CW contest operation that Tubby excelled and he won awards from all the amateur countries of the world. The electronic kayakers that he designed and built are well known wherever code is used.

I first worked Tubby on Dec. 26th 1937; and shortly after that date we set up weekly skeds which, other than war years and when he was abroad (when we wrote), we kept up to the time of his death. The last sked was just an hour or so before he died, when he told me of a new TVI filter he had developed. These skeds became well known and many others joined in over the years and I know that several SW's became Amateurs because of listening to them.

I and many others, will always remember him by his saying when faced by a problem: "There must be an easier way of doing this".

**FTV-650 6 metre Transverter** in new condition with handbook, \$150. VK2ZDJ, 45 Blume Ave., Griffith. Ph. (069) 62 4937 A.H.

## WANTED

**Kleinschmidt Typewriter TT-119** or similar, any condition. Also Kleinschmidt series governed motor. Ed Penkiss VK1VP, QTHR.

**Multi 7 2m Transceiver**, complete with repeater xtl, in going order or not; or repeater sets 1-8 suit same set (separate). Ring Geoff VK2AZT. Ph. (069) 42 1392 with prices.

**Information/Circuit/Handbook BC 348m Rx and PS** for school electronics group, self supporting lower to 50 ft. If in sections, Hunter Valley area. Quote to VK3BLP, Warners Bay NSW.

**Linear Amp.** 80-10m, good condition; VLF receiver down to about 14 MHz. Details and price to VK6ED, QTHR.

**Linear Amplifier** for HF bands, commercial unit preferred. Particulars to VK3PWP, QTHR. Ph. (03) 99 5527.

**Kyokuto Synth. 2 Mx Transceiver**, VK3AFW, QTHR.

## SILENT KEYS

It is with deep regret that we record the passing of —

**Mr. M. P. MARSHALL VK3MM**  
**Mr. J. MARSLAND VK3NY**  
**Mr. L. H. VALE VK5NO**  
**Mr. R. H. MUTTON L20413**

All amateurs would like to extend their deepest sympathy to the wife Joyce, who has had a harrowing time over the last few years because she knew that Tubby could get at any minute's daughters Stephanie and Joanne and son Jeff VK3BHC.

73 Tubby Sk de VK2AHM Jeff

**JIM MARSLAND VK3NY**  
It is with great sorrow we record the passing of Jim Marsland VK3NY, on the 20th September, 1977.

Jim was licensed in 1931 and three months later moved to Campdown where he actively communicated and experimented on the 3.5 and 7 MHz bands and on the then very popular 20 metre broadcast band.

At a later date he moved back to Melbourne and was an active member of the Victorian Division of the Wireles a Institute of Australia Prior to World War II he was a member of the RAAF Wireless Reserve from which the Combined Services drew so many well trained operators.

In 1933 Jim was appointed to the Amateur Radio magazine committee to which he devoted tremendous energy, particularly during World War II when the magazine was produced on rationed paper supplies and took the form of a rationed publication. He continued this work until 1965.

In 1935 he was appointed Treasurer of the Victorian Division of the WIA which post he held until 1948. He carried out this arduous task in addition to the continuous work of the Magazine Committee. The continued success of the WIA Victorian Division and of the official WIA magazine was in no small part attributable to the interest and energy of Jim Marsland who gave unsparingly of his time in an honorary capacity.

Like all amateurs, he contributed his part to the vast world-wide network of amateur radio operators who have done so much for the progress of communications and whose international goodwill has bridged the boundaries of race, colour and creed in a manner unsurpassed by mankind in other walks of life.

The fraternality of amateur radio operators is the sadder for his passing and extend sympathy to the bereaved family of VK3NY.

**Licensed Amateur** (full call) for private tutoring a student going for licence. Prefer local person. Fee negotiable (theory only). Ph. (03) 97 6031 (Moorebabin).

**Mini-Products Hybrid Quad Antenna**, 5-10-15-20m. Details and price to Ken VK6ZA, Box 768, Carnarvon 6701. Ph. (099) 41 1001.

**Forest Phone**, silver converted or suitable for conversion to 160m. Please write John Davis VK3BJ, P.O. Box 195, Greensborough 3088. Ph. (03) 435 4599.

**Bottom mast clamp** for EMOTATOR beam rotator. Model 1100M or rotator complete with bottom mast clamp. VK3LS, QTHR. Ph. (03) 82 2152.

**German WW II Military Morse Telegraph Key**. Preferably in going order. VK3GK, Box 5, Clayton. Ph. 3182. Ph. (03) 544 4168.

**FT101 transceiver**, prefer early model to \$400. Particulars to VK3COM, QTHR. Ph. (03) 560 9215.

**Antenna tower Hy-gain "Hy-Tower"** model 18HT, 10m to 10m vertical. VK2BFG, QTHR. Ph. (043) 32 5758 any time.

**FT200** or similar twer, unmodified, will pay up to \$400. VK3NCP, QTHR.

**DRAKE**

# C-Line Amateur Equipment

**\$795**

## Drake R-4C

Solid State Linear permeability-tuned VFO with 1 kHz dial divisions. Gear driven dual circular dials. High mechanical, electrical and temperature stability.

Covers ham bands with crystals furnished. Covers all of 80, 40, 20 and 15 meters, and 28.5-29.0 MHz of 10 meters.

Covers 160 meters with accessory crystal. In addition to the ham bands, tunes any fifteen 500 kHz ranges between 1.5 and 30 MHz, 5.0 to 6.0 MHz not recommended. Can be used for MARS, WWV, CB, Marine and Shortwave broadcasts.

Superior selectivity: 2.4 kHz 8-pole filter provided in ssb positions. 8.0 kHz, 6-pole selectivity for a-m. Optional 8-pole filters of .25, .5, 1.5 and 6.0 kHz bandwidths available.

Tunable notch filter attenuates carriers within passband.

Smooth and precise passband tuning.

Transceive capability; may be used to transceive with the T-4X, T-4XB or T-4XC Transmitters. Illuminated dial shows which PTO is in use.

Usb, lsb, a-m and cw on all bands.

Agc with fast attack and two release times for ssb and a-m or fast release for break-in cw. Agc also may be switched off.

New high efficiency accessory noise blander that operates in all modes.

Crystal lattice filter in first i-f prevents cross-modulation and desensitization due to strong adjacent channel signals.

Excellent overload and intermodulation characteristics.

25 kHz Calibrator permits working closer to band edges and segments.

Scratch resistant epoxy paint finish.

**\$47**

## Drake MS-4

Drake MS-4 Matching Speaker for use with R-4, R-4A, R-4B and R-4C Receivers. (Has space to house AC-3 and AC-4 Power Supplies).

**\$695**

## Drake T-4XC

Solid State Linear permeability-tuned VFO with 1 kHz dial divisions. Gear driven dual circular dials. High mechanical, electrical and temperature stability.

Covers ham bands with crystals furnished. Covers all of 80, 40, 20 and 15 meters, and 28.5-29.0 MHz of 10 meters.

Covers 160 meters with accessory crystal. Four 500 kHz ranges in addition to the ham bands plus one fixed-frequency range can be switch-selected from the front panel.

Two 8-pole crystal lattice filters for sideband selection.

Transceives with the R-4, R-4A, R-4B, R-4C and SPR-4 Receivers. Switch on the T-4XC selects frequency control by receiver or transmitter PTO or independently. Illuminated dial shows which PTO is in use.

Usb, lsb, a-m and cw on all bands.

Controlled-carrier modulation for a-m is compatible with ssb linear amplifiers.

Automatic transmit-receive switching. Separate VOX time-delay adjustments for phone and cw. VOX gain is independent of microphone gain.

Choice of VOX or PTT. VOX can be disabled by front panel switch.

Adjustable pi network output.

Transmitting agc prevents flat-topping.

Meter reads relative output or plate current with switch on load control.

Built-in cw sidetone.

Spotting function for easy zero-beating.

Easily adaptable to RTTY, either fsk or afsk.

Compact size; rugged construction. Scratch resistant epoxy paint finish.

## High Pass Filters for TV Sets

provide more than 40 dB attenuation at 52 MHz and lower. Protect the TV set from amateur transmitters 6-160 meters.



### Drake TV-300-HP

For 300 ohm twin lead **\$13**



### Drake TV-75-HP

For 75 ohm TV coaxial cable; TV type connectors installed **\$17**

**\$165**

MN-4 (Model No. 1507)

**\$310**

MN-2000 (Model No. 1509)

## Drake MN-4 & MN-2000 Matching Networks

- **Integral Wattmeter** reads forward power in watts and VSWR directly; can be calibrated to read reflected power • **Matches 50 ohm transmitter output** to coax antenna feedline with VSWR of at least 5:1 • **Covers ham bands 80 thru 10 meters** • **Switches in or out** with front panel switch • **Sizes:** 5 1/4" H, 10 1/4" W, 8" D (14.0 x 27.3 x 20.3 cm). MN-2000, 14 1/4" D (36.5 cm).
- **Continuous Duty Output:** MN-4, 200 watts; MN-2000, 1000 watts (2000 watts PEP) • **MN-2000 only:** Up to 3 antenna connectors selected by front panel switch.

## TVI Filters

**NEW SHIPMENT — JUST ARRIVED**  
**Low Pass Filters for Transmitters**

have four pi sections for sharp cut off below channel 2, and to attenuate transmitter harmonics falling in any TV channel and fm band. 52 ohm. SO-239 connectors built in.

### Drake TV-3300-LP

1000 watts max. below 30 MHz. Attenuation better than 80 dB above 41 MHz. Helps TV-I interference, as well as TV front-end problems. **\$32**



### Drake TV-5200-LP

200 watts to 52 MHz. Ideal for six meters. For operation below six meters, use TV-3300-LP or TV-42-LP. **\$32**



### Drake TV-42-LP

is a four section filter designed with 43.2 MHz cut-off and extremely high attenuation in all TV channels for transmitters operating at 30 MHz and lower. Rated 100 watts input. **\$19**



Prices shown include Tax

Write, 'phone or call for technical information.

P.O. Box 30, Concord, N.S.W. 2137.

Telephone: 736-2888.

Melbourne: P.O. Box 107, Mt. Waverley, Vic. 3149.

Telephone: 233-4044.

Adelaide: 42-6666; Brisbane: 392 2884.

Perth: 25-3144.

**ELMEASCO****Instruments Pty. Ltd.**

Telex AA30566, Cables & Telegrams: "IZYCOM"  
Melbourne  
Dealers in all States and Territories



# The Bulletin

NOVEMBER, 1977

W.A. SUPPLEMENT TO "AMATEUR RADIO"

#####

## BULLETIN

All material for inclusion in The Bulletin to reach the Editors by Phone, on Air, or mail to Flat 74, 50 Cambridge Street, West Leederville, 6007 before 10th. of each month.

L. A. Ball	VK6AN	814531
J. Blaxendale	VK6JD	
A. Baxter	L6C213	493335

## CORRESPONDENCE

All other correspondence should be addressed to :-  
Hon Secretary W.I.A. (W.A. Division)  
P.O. Box N1002  
PERTH  
W.A. 6001

#####

## GENERAL MEETING

Held on the THIRD Tuesday of each month at 1945 Hours at Science House, 710 Murray Street, WEST PERTH.

## COUNCIL MEETING

Held at the QTH of the Secretary, 388 Huntriss Road, Woodlands, on the LAST Tuesday of each month at 1930 Hours.

OBSERVERS WELCOME

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## NOTICE OF MOTION

FOR JANUARY 1978 SPECIAL MEETING

A SPECIAL GENERAL MEETING has been called for Tuesday 17th. January, 1978 at Science House, 710 Murray Street, West Perth during the Monthly General Meeting to consider the following NOTICES OF MOTION.

(1) That the motion as recorded in the minutes of the General Meeting of 18th. February 1975, amendments to the Constitution which were to be adopted, on the motion of VK6RU seconded by VK6PM be passed to an Annual General Meeting to be adopted, now instead be adopted at a Special General Meeting.

Signed VK6DA VK6NE VK6NK

(2) That the Constitutional Amendments referred to at the meeting of February 18th. 1975 meeting be adopted

Signed VK6DA VK6NE VK6NK

#####

# FREE ????? Q.S.L. BUREAU

At several meetings we have heard comment on the fact that our QSL Bureau involves some cost to members. (That is if you consider 5 cents per card an extreme cost.)

Recently a letter in AR from one of our members about having a free QSL Bureau brought forth from the N.S.W. Division the fact that they conducted a FREE Bureau.

Well. Almost free. If you dont want your incoming cards more than once a year, and don't mind cards going overseas when the waiting pile reaches an economical weight to post. If so- then its free.

Otherwise have enough S.A.S.E's with the Bureau to maintain a regular delivery to you, and post the cards to rare countries yourself.

Come to think of it - we are not bad off at 5 cents per card.

#####

## HAMADS

### FOR SALE

Kw Viceroy Mark 3A Tx 10 - 80 Metres  
Pair 6146's in Final

\$340.00

HALLICRAFTERS SX117 Rx. Triple Conversion  
xtal calabrator - Xtals for 160 metres ( plus 160 M C  
converter) 80 - 40 - 20 - 15 - 10, up to 29 MHz.  
10 MHz WWV and provision for 5 further 500 KHz.  
Segments in range 75 KHz to 30 MHz

\$275.00

SB200 10 - 80 MHz. Linear Amplifier  
2 x 572B in Final

\$400.00

DX100 Tx. 160 - 10 Metres c.w.rig  
includes hefty (2KW ??) 117/234 Transformer  
\$60.00

VK6HD M. Bazely

### WANTED

Members to form a roster for the Sunday morning  
W.I.A. (W.A. Division ) Broadcast. Each member to  
do about 3 weeks at a time. The more members in  
the roster the further it will be between sessions.  
Apply VK6 Council

### WANTED

News , technical and general items of interest for  
inclusion in The Bulletin. VHF, RTTY, Repeater  
information etc very welcome.

Please forward to Bulletin Editors.

WANTED

Information for the Intruder Watch Co-Ordinator. Any information about any Intruder on any band would be greatly appreciated.

Please forward to Dave VK6WT

#####

# CHRISTMAS PARTY 1977

The usual Christmas "get together" will be held at Science House on Tuesday 20th. December 1977 following the normal monthly meeting. Light food and soft drink will be supplied but if you require something harder then B.T.O.

A small charge will be made to cover the costs of the evening as it is the intention of the Council to make the evening as self supporting as possible.

Put this date on you calander and make sure that you inform the XYL (or YL) of the arrangements.

Awards to the winners of the various contests will be made on this evening and also the award to the Amateur of the Year for 1977. It should prove to be a very interesting evening so we hope that everyone will come along and enjoy themselves.

C U THERE

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# JAMBOREE ON THE AIR

This has just been completed and so far we have not a great deal of detail on numbers etc. but these will be printed as soon as they become available.

For a change the bands were wide open ,or at least a great deal more open than they have been for a number of years. We have heard that quite a number of contacts were made on 15 and 10 Metres. The skip was just not open to the Eastern States and these were not as numerous as previously.

Amateur TV was used for the first ime and although there were only a couple of stations using this mode it did prove to be very popular and we hope to see more of it in the future.

The RTTY stations were far more numerous this year and once again created a great deal of interest.

We did have one complaint from one Scout who tried all weekend to make a CW contact with one of the Novices. We believe that this lad is sitting for his Novice at the next exam. Alas no suitable stations were heard. Maybe next year we can arrange some slow morse contacts for these lads who are interested. I wonder if any station actually made a CW contact during J.C.T.A.????????????? It must be a few years since we heard CW contacts being made on this weekend.

On behalf of the Scout Association of Australia ( W.A. Branch) I would like to thank all Amateurs who assisted with their time and gear over the weekend of J.O.T.A. This was truly appreciated by all members concerned and we look forward to your continued co-operation in future years.

Any comments from any operators would be appreciated by the organisers as it would assist in smoothing things out next year

Unless we recieve some "feedback" it is hard to know just what we must do to make the weekend even more successful. Please forward your comments to J.O.T.A Co-ordinator VK6AN or to the Bulletin.

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## GARDEN CITY DISPLAY

The display at Garden City Shopping Centre, Booragoon, was a terrific success and sincere thanks must go to the great number of Amateurs who assisted with equipment, displays, setting up the display, manning the display and all the other numerous jobs that have to be done.

It is extremely hard to ascertain just how many people actually attended the display as they were coming and going all morning but the comments recieved were extremely favourable and it appears that everyone was delighted with it. Much interest was shown in the Amateur TV, the RTTY and the "gimiks" sections. The MORSE CODE section proved to be far more popular than had ever been imagined and this appears to be a real must for future displays.

Another display is being considered by our PR man but this will not be untill into 1978 to give everyone concerned a chance to get over the last one. To all concerned with this our sincere thanks for a fantastic job and we hope that it has done at least something to put Amateur Radio in the correct light in the eyes of the general public.

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## C.W. GROUP

We hear ,on the grapevine, that several people are interested in forming a C.W. Group as a social activity. We would like to hear more about it so we could tell you more about it but at this stage all we can suggest is that if you are at ll interested that you call in after the Slow Morse Transmissions held each night Monday to Friday on 3555kHz. These normally conclude shortly after 2030 Hours WAST and we are sure that those on net will be able to tell you the full story and let you know what is going on.

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## SCOUT WEEK 1978

We are advised , from our Scouting Amateurs, that a full week of Scout activities will be held in September 1978 and they would greatly appreciate the involvment of Amateur Radio in this week . Many activities are planned such as Trips to Kettnest, Bike Hikes, Adventure Camps, Fishing Camps,Picnics, Caveing trips and the all important Gang Show.

We wonder if any Amateur operators would be willing and available to give the Scouts a hand over this week by operating stations at the various points. It could be a lot of fun for them as well as for the scouts , cubs, guides and brownies taking part.

If you feel interested then please do not hesitate to contact Peter VK6HU or Les VK6AN who will put your name on the list and arrange things to suit you.

T H E E N D